THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.

Telegrams: LANCET, WESTRAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. VIII. OF VOL. II., 1930. LONDON, SATURDAY, AUGUST 23, 1930 Pp. 112—Price 1s.

No. 5582. Vol. CCXIX. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS

SEE PAGE 3.

BY J. F. HALLS DALLY, M.A., M.D. CANTAB., M.R.C.P., Senior Physician to Mount Vernon Hospital.

HIGH BLOOD PRESSURE

Second Edition, Revised and Enlarged. Illustrated. 12s. 6d. net.

LOW BLOOD PRESSURE

Its Causes and Significance. Illustrated. 15s. net.

Wm. Heinemann (Medical Books), Ltd., 99, Great Russell St., W.C.1.

OESOPHAGEAL OBSTRUCTION: ITS PATHOLOGY, DIAGNOSIS AND TREATMENT (including four chapters on Cancer of the Œsophagus).

By A. LAWRENCE ABEL, M.S. Lond., F.R.C.S. Eng., Assistant Surgeon to the Cancer Hospital, &c.

Pp. 245. 132 Illustrations. 2 Col. Plates. 30s. net.

"Masterful and complete. . . . Cannot be too highly praised."—SURG. GYN. AND OBSTET. JOUR.

Oxford University Press, Amen House, London, E.C.4.

CANCER OF THE BREAST, AND ITS TREATMENT.

By W. SAMPSON HANDLEY, M.S., M.D.Lond., F.R.C.S. Eng.

Second Revised Edition. With 82 Illustrations. 30s. net.

Published for the Middlesex Hosp. Press by John Murray, London.

THE THOMAS SPLINT AND ITS MODIFICATIONS IN THE TREATMENT OF FRACTURES.

By MEURICE SINCLAIR, C.M.G., M.B., CH.B.(EDIN.).

Pp. 152. 85 Illus., with X-Ray Photographs, 3 Charts. 15s. net.

Oxford University Press, Amen House, London, E.C.4.

PRACTICAL PSYCHOTHERAPY.

THERAPY OF PERSONAL INFLUENCE.

By EDWIN HOPEWELL-ASH, M.D. An A.B.C. of Treatment by Personal Influence, Suggestion and Medical Hypnosis.

Obtainable from BM/ELHA, London, W.C.1. 2/9 post free.

THE TONSILS AND ADENOIDS AND THEIR DISEASES: INCLUDING THE PART THEY PLAY IN SYSTEMIC DISEASES.

By IRWIN MOORE, M.B., C.M.

Demy 8vo. 395 pp. 107 Illustrations. Price 21s. net.

"On any question regarding tonsils and adenoids, this exhaustive work by Dr. Irwin Moore must be regarded as the final authority for many a long day to come."—PRACTITIONER.

"Provides an admirable guide, reliable and up to date, on the subject dealt with."—MEDICAL TIMES.

"Should be in the library of the medical student, general practitioner and the consultant."—MEDICAL WORLD.

Wm. Heinemann (Medical Books), Ltd., 99, Great Russell-street, London, W.C.1.

NEW EDITIONS AND LATEST PRICES.

TAYLOR & POULTON'S "MEDICINE." 25s.
Fourteenth Edition. 167 Illustrations.

STARLING'S "PHYSIOLOGY." 21s.
Fifth Ed. By Prof. LOVATT EVANS. 543 Illustrations.

BOWLBY & ANDREWES' "SURGICAL PATHOLOGY." 21s.
Eighth Ed. By GEOFFREY KEYNES, F.R.C.S.

ROMANIS & MITCHINER'S "SURGERY." 28s.
Third Ed. Two vols. 716 Illustrations.
Three Editions in Three Years.

London: J. & A. Churchill, 40, Gloucester-pl., Portman-sq., W.1.

TWENTIETH EDITION

MINOR SURGERY AND BANDAGING

By GWYNNE WILLIAMS, M.S., F.R.C.S., Surgeon, University College Hospital.

262 Illustrations. 10s. 6d.

London: J. & A. Churchill, 40, Gloucester-pl., Portman-sq., W.1.

STONE AND CALCULOUS DISEASE OF THE URINARY ORGANS.

By JOHN SWIFT JOLY, M.D. (Dublin), F.R.C.S. (Eng.).

Large Crown 4to. Four Coloured Plates, 188 figures in the text. 45s. net.

BRITISH JOURNAL OF UROLOGY.—"No English-speaking urologist can afford to be without this volume . . . we know of no book in any language that covers the ground in so admirable a manner."

Wm. Heinemann (Medical Books), Ltd., 99, Great Russell-street, London, W.C.1.

READY SEPTEMBER 3.

THE FIRST VOLUME OF

THE CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS.

IMPORTANT ANNOUNCEMENT.

SEE PAGE 56.

London: THE LANCET LTD., 7, Adam-street, Adelphi, W.C.2.

English Edition. Revised and brought up to date.

MUSKENS' EPILEPSY: COMPARATIVE, PATHOGENESIS, SYMPTOMS AND TREATMENT.

Foreword by Sir CHARLES SHERRINGTON, F.R.S.

¶ "A book which embraces both the physiological and the clinical aspects of epilepsy . . . . sound and well-balanced."—THE LANCET.

Royal 8vo. Pp. xiv + 435, with 54 Illustrations. Price 27s. 6d; postage: inland 9d.; abroad 1s. 2d.

Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

LEWIS'S PUBLICATIONS

With 14 Coloured Plates and 435 Illustrations (included in 66 Plates and the Text). Royal 8vo. £2 10s. net.

DISEASES OF THE SKIN

A Textbook for Students and Practitioners.

By J. M. H. MACLEOD, M.A., M.D., F.R.C.P., Physician for Diseases of the Skin, Charing Cross Hospital, London Hospital for Tropical Diseases, and Victoria Hospital for Children; Lecturer on Dermatology, London School of Tropical Medicine, &c.

". . . one of the most important books on dermatology produced in this country in recent years . . . singularly complete. The Author is to be congratulated on his work, which is a credit to British Dermatology."—*British Medical Journal.*

With Illustrations. Demy 8vo. Pp. xviii + 612. 28s. net; postage 1s.

HUMAN BIOLOGY AND RACIAL WELFARE

Edited by E. V. COWDRY, Ph.D., Professor of Cytology, Washington University, St. Louis. Introduction by EDWIN R. EMBREE.

Publisher's Note.—"This volume aims to present the current status of scientific knowledge in those branches of science most vitally affecting man, and grouped for convenience under the heading of 'Human Biology.' Each authority covers his special field conservatively and plainly, with adherence to fact and with racial welfare in mind."

*** *Prospectus on application.*

THIRD EDITION. Brought fully up to date and based on Modern Principles. With 52 Plates, including 58 Figures. Demy 8vo. 35s. net; postage 1s.

THE DERMATERGOSES OR OCCUPATIONAL AFFECTIONS OF THE SKIN

Giving Descriptions of the Trade Processes, the responsible agents and their actions.

By R. PROSSER WHITE, M.D.Edin., M.R.C.S., President of the Certifying Factory Surgeons' Association, Life Vice-President, Consulting Dermatologist, Royal Albert Edward Infirmary, Wigan; ex-President of the London Dermatological Society, &c.

". . . It is an international book."—*Zeit. f. Haut u. Gesch.*

". . . A fine book, a very fine book."—*British Journal Dermatology and Syphilis.*

In Three Volumes. Royal 8vo. With 1072 Illustrations. £6 6s. net.

KAUFMANN'S PATHOLOGY

For Students and Practitioners.

Authorized Translation of "Lehrbuch der Pathologischen Anatomie," by Dr. EDUARD KAUFMANN, Professor of General Pathology and Pathological Anatomy and Director of the Pathological Department, University of Göttingen, etc. Translated by STANLEY P. REIMANN, M.D., Pathologist-Director of the Research Institute of the Lankenau Hospital, Philadelphia, etc.

Illustrated Prospectus on application.

". . . one of the best known and most widely valued works . . . the book has obtained a world-wide reputation."—*British Medical Journal.*

LONDON: H. K. LEWIS & CO. LTD., 136 GOWER STREET and 24 GOWER PLACE, W.C.1

Telegrams: "Publicavit, Eusroad, London." *** Complete CATALOGUE of publications post free on application. Telephone: Museum 7756-7-8

ZŌPLA STRAPPING

fulfils every function a good strapping should

1. Greatest tenacity of any. It grips.
2. A formula which offers the greatest possible provision against cases of irritation. Easily the best in this respect.
3. It is the best keeping plaster; further, the cloths used are of great strength, specially woven with the strongest yarns where wanted.

"The Standard."

EACH SPOOL PACKED IN A TIN. SAMPLES ON REQUEST.

LESLIES LTD., High St., WALTHAMSTOW, LONDON, E.17.

NEUROTIC CARDIAC PAIN

may or may not have an immediate serious cardiac import, but *it is always serious to the patient*, both in its physical and its mental effects. Most of these types of precordial pain, moreover, are caused in some way by the heart itself, and are attended by some degree of palpitation and arrhythmia.

ANASARCIN RELIEVES

the majority of these patients. Indeed, in many cases it acts like magic in dispelling these distressing precordial pains, and restoring comfort and well-being to the patient.

NO UNTOWARD EFFECTS

need be feared from the use of Anasarcin in these cases. It is a rational, physiologic heart tonic, steadying the beat, dilating the arterioles, and toning the muscle. You can regulate its dosage to a nicety, avoiding all cumulative and other undesirable effects.

Permit us to send you a copy of our booklet, "Anasarcin in Disorders of Heart and Vascular System."
Also Sample of Anasarcin for your trial.

THE ANASARCIN CHEMICAL CO., Winchester, Tennessee, U.S.A.

Samples and Literature to the Medical Profession on request to
THOMAS CHRISTY & CO., 4/12, Old Swan Lane, London, E.C.4, Distributors for British Isles.

Valentine's Meat-Juice

In **Tropical Fevers, Malarial, Yellow** and **Typhoid Fever,** where the **Impaired Digestive Organs** are rejecting food and it is **Essential** to **Conserve** the **Weakened Vital Forces,** the value of **Valentine's Meat-Juice** has been demonstrated in Hospital and **Private Practice.**

J. E. Austin, M. D., *New York, late Chief Surgeon, Costa Rican Railroad, Limon, Costa Rica, Central America:* "While Chief Surgeon to the Costa Rican Railroad I used VALENTINE'S MEAT-JUICE largely. I found it a most valuable nutriment in all forms of acute and chronic diseases where a liquid and easily assimilated food was necessary. Given with cracked ice in small and frequent doses, I have found it very useful in the extreme gastric irritability in severe forms of Malarial and Yellow Fever. In many cases of Malarial and Tropical Diarrhœa, it was the only nourishment allowed. In those countries where it is difficult to procure a suitable dietary for patients it is invaluable."

VALENTINE'S PREPARATION
NUTRIO
VOLUME 1 4/5 OZ.
MEAT JUICE
DIRECTIONS. Dissolve one teaspoonful of the Preparation in three tablespoonfuls of cold or warm water boiling water changes the character of the preparation

For sale by all Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY,
A 51 **RICHMOND, VIRGINIA, U. S. A.**

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS.

No. 5582. LONDON, SATURDAY, AUGUST 23, 1930. CCXIX.

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

ADDRESSES AND ORIGINAL ARTICLES.

Diabetes as a Physiological Problem. By Prof. J. J. R. MACLEOD, F.R.C.P., F.R.S. I.—(*Illustrated*) 383

The Medical Treatment of Cancer. By A. T. TODD, M.R.C.P.—(*Illustrated*) . 389

Rheumatism in Childhood. By WILFRID SHELDON, M.R.C.P.—(*Illustrated*) . 394

CLINICAL AND LABORATORY NOTES.

Protein Milk in Infant Feeding. By NORMAN HILL, M.R.C.P., and A. W. C. MELLOR, M.B. 398

Catheter-extraction of a Ureteral Stone per Urethram. By E. H. R. ALTOUNYAN, M.D.—(*Illustrated*) 399

Eclampsia Treated with Spinal Anæsthesia. By R. H. PARAMORE, F.R.C.S. 399

MEDICAL SOCIETIES.

International Congress of Dermatology and Syphilis. Copenhagen: Eczema. — Tuberculosis of the Skin 401

NEW INVENTIONS.

An Improved Fine Adjustment Oxygen Valve. By K. B. PINSON, M.B.—(*Illustrated*) 402

REVIEWS AND NOTICES OF BOOKS.

The Autonomic Nervous System. By Prof. Albert Kuntz, M.D. 403

Mycoses of the Spleen. By G. A. Gibson, F.R.C.P. 403

On Faith and Science in Surgery. By Sir John Bland-Sutton 403

Ultra-violet Radiations and their Uses. By Robert Aitken, F.R.C.P. 404

Physiological Principles in Treatment. By W. Langdon Brown, F.R.C.P., and R. Hilton, M.R.C.P. 404

Science in Soviet Russia. By J. G. Crowther 404

LEADING ARTICLES

HEALTH OF THE CASUAL POOR 405

MEDICAL TREATMENT OF CANCER 406

LOCAL REST IN PULMONARY TUBERCULOSIS 407

ANNOTATIONS.

The Parental State and Impersonal Medicine ... 408

The Blood Bilirubin in "Apoplexy." 408

William Beaumont and the Gastric Juice 409

X Rays in Filariasis 409

An Official Correction from the M.R.C. 410

Insulin in Oil 410

Milk Fever 410

Uniformity in Records of Maternal Deaths 411

London County Coronership Changes 411

French Mental Hospitals .. 412

SPECIAL ARTICLES.

The Casual Poor. A Study of Economic and Social Failure. Committee's Recommendations 415

Lister Institute of Preventive Medicine: Department of Biochemistry 416

Medicine and the Law: Duties of a Police Surgeon 418

Berlin: Change in the Sickness Insurance Law. 419

Budapest: Infant Protection in Hungary 420

United States of America: Epidermophytosis 421

Australasia: The Primary Fellowship Examination 421

CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS.

LXXXII.—The Clinical Significance of Slit-lamp Appearances.—Part II. By CHARLES GOULDEN, F.R.C.S. 413

PUBLIC HEALTH SERVICES.

Results of Artificial Light Treatment for Tuberculosis. By G. LISSANT COX, M.D. 422

Reports of Medical Officers of Health: Edinburgh.—Liverpool.—Coventry.—Derby 423

Reports of School Medical Officers: Derbyshire.—Hull. — Warrington. — Rutland 424

Infectious Disease in England and Wales 424

CORRESPONDENCE.

Inequalities in Radium Tubes (Mr. John H. Watson). (*Illustrated*).. 426

Colour-vision and Colour-blindness (Mr. F. W. Edridge-Green) 426

Treatment of Pulmonary Tuberculosis in Switzerland (Dr. R. S. McClelland, Dr. D. McAlpine) 426

Umbilical Hernia in Infants (Dr. J. Hamilton Hart) . 427

Fire Precautions in Nursing Homes 427

Drains 427

OBITUARY.

John Elder MacIlwaine, M.D. 428

Charles Brook, F.R.C.S. .. 429

Prof. Axenfeld 429

THE SERVICES

Royal Naval Medical Service. — Royal Army Medical Corps. — Royal Air Force.—Indian Medical Service.—Deaths in the Services.. 429

MEDICAL NEWS.

Mental Treatment Act, 1930: Approved Medical Practitioners 430

Willesden Cancer Clinics.. 397

Skipton District Hospital.. 400

Tunbridge Wells Joint Hospital 402

Hospital Saturday Fund.. 407

Charing Cross Hospital ... 407

Sunderland's Medical Services 414

City of London Maternity Hospital 429

New Infirmary at Dewsbury 434

St. Thomas's Hospital 430

Chartered Society of Massage, etc. 430

Medical Society of Individual Psychology . 430

Modern Churchmen's Conference 430

People's League of Health 430

Paddington Medical Society 430

University College Hospital 430

Manchester Royal Infirmary Old Residents' Club 430

Hospitals as Companies ... 430

High Wycombe War Memorial Hospital 430

St. Mark's Hospital 430

Croydon Hospital 430

Torbay Hospital Chapel .. 430

Sidmouth Cottage Hospital 430

Carlisle as a Medical Centre 430

NOTES, COMMENTS, AND ABSTRACTS.

Preventive Medical Examinations in Industry and Organised Medical Practice. By Dr. RENÉ SAND. 432

Social Service Department of St. Thomas's Hospital 433

A New Wrapper for Medicine Bottles 433

Clothing for Women in the Tropics 434

New Preparations 434

Nursing in the U.S.A. 434

INDEX NOTICE.

THE LANCET, Vol. I., 1930 431

Appointments 431

Vacancies 431

Births, Marriages, Deaths. 431

THE LONDON AND COUNTIES MEDICAL PROTECTION SOCIETY LIMITED

(FOUNDED 1892)

Registered Office: VICTORY HOUSE, LEICESTER SQUARE, W.C.2.

Telegrams: "MEDICAVERO, WESTRAND, LONDON." *Telephone:* REGENT 0611.

President: Sir JOHN ROSE BRADFORD, K.C.M.G., C.B., C.B.E., M.D., P.R.C.P., F.R.S.
Treasurer and Chairman of Council: C. M. FEGEN, M.R.C.S., L.R.C.P., D.P.H.
Trustees for the Reserve Fund:
Rt. Hon. LORD DAWSON, P.C., G.C.V.O., K.C.B., M.D., F.R.C.P. Sir JOHN ROSE BRADFORD, K.C.M.G., C.B., C.B.E., M.D., P.R.C.P., F.R.S. Sir HARRY BALDWIN, C.V.O., M.R.C.S., L.D.S.

The Society was founded for the following purposes: To protect, support, and safeguard the character and interests of legally qualified Medical and Dental Practitioners; to advise and assist Members of the Society in matters affecting their professional character and interests; and to indemnify them in regard to actions, etc., undertaken on their behalf.

SUBSCRIPTIONS:—There is an entrance fee of 10s., and an Annual Subscription of £1.

The Invested Funds of the Society exceed £43,000. The Society is fully insured to an unlimited extent against all adverse costs and damages which may be awarded against Members in any action which the Society undertakes on their behalf.

Forms of application for Membership and full particulars may be obtained from the Secretaries at the above address.

THE MUSEUM GALLERIES

Telephone : Temple Bar 3932 (STUDIOS) *Telegrams : Museumgal*

53, SHORT'S GARDENS, DRURY LANE, LONDON, W.C. 2

THE RAKE'S PROGRESS
IN COLOUR

FOLLOWING upon our notices in April, May and June, the accompanying illustration is from the second state of Plate 2 of "THE LEVEE." If you did not see the previous announcements illustrating the progressive states and you are interested in the technique, the Publishers will be pleased to send you a prospectus giving full information together with miniatures of the work in colour. The Publishers ask you to watch this page for further illustrations, showing how the Engraver gradually fills up the whole plate with innumerable stipple dots until finally the plate is ready for the impressions IN COLOUR. It should be noted that the edition is strictly limited and that the list is being rapidly subscribed, although the series will not be completed until 1935.

"THE LEVEE." PLATE TWO.
After William Hogarth 1697-1764. Engraved in Stipple by E. J. Stodart.

To The Museum Galleries,
53, Short's Gardens,
Drury Lane, W.C.2.

THE LANCET (23/8/30.)

Gentlemen,

Please send me full particulars of the Subscription for the Hogarth Series of Engravings, together with Prospectus and Miniatures in Colour.

Name.....

Address.....

ADDRESSES AND ORIGINAL ARTICLES

DIABETES AS A PHYSIOLOGICAL PROBLEM.*

By J. J. R. Macleod, M.B., LL.D. Aberd., F.R.C.P. Lond., D.Sc. (Hon.) Toronto, F.R.S.,
REGIUS PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF ABERDEEN.

LECTURE I.

THESE lectures give me the opportunity to present a review of certain investigations in experimental diabetes, which have been carried out during the past few years under my direction in the Physiological Laboratory of the University of Toronto. Most of these researches will be dealt with in the first lecture and, in the second one, I shall consider a problem in metabolism which is now coming to the forefront in both laboratory and clinic—namely, the control of the secretion of insulin.

History of Two Depancreatised Dogs.

I shall begin by giving a short account of the clinical history of two dogs which were kept alive by treatment with insulin for about four years after complete removal of the pancreas. The animals remained throughout this time in excellent condition, and death occurred in one of them on the fifth, and in the other on the sixth day after discontinuing insulin. There cannot be the slightest doubt that both dogs would have survived to the full span of their normal lives had the treatment been continued.

I regret now that this plan was not followed. The reason for removing insulin was to determine the intensity of the resulting diabetes by observing, among other things, the behaviour of the respiratory quotient, and it was intended that this should be done on the third and fourth days. Unfortunately, a serious fire broke out in the laboratory on the morning of the third day, and it took all this day to repair damage to the respiratory apparatus. The dogs being as yet apparently unaffected, it was decided to continue with the programme as originally planned, except that the respiratory observations were postponed to the fourth and fifth days. Although we knew from our experience with other similarly treated dogs that we were incurring grave risks of losing the animals from coma, on account of their fattened condition, we expected to be able to guard against this by treatment with insulin immediately any definite symptoms, such as vomiting and drowsiness, showed themselves. But unfortunately, these symptoms only developed after it was too late to save the animals.

During their sojourn in the laboratory, both dogs were under constant observation and each was occasionally used in the first year for experiments relating to diabetes. Several of the results have been published from time to time, and in the clinical histories which I now offer I will indicate where these may be found. It will be convenient if I first of all give an account of each animal during the course of the insulin treatment, and then describe that of the diabetes which supervened when it was discontinued.

1. Dog 23, a female mongrel, weighing about 8 kg., was completely depancreatised on Sept. 17th, 1923, by Dr. F. N. Allan. It was kept on a diet of meat and cane sugar with insulin injections twice daily, on which it maintained its weight fairly well. On March 5th, 1924, it was used by Drs. Allan and Sokhey in their investigations of the effect of diabetes and of insulin on the excretion of phosphorus.[1] On March 8th this observation had to be terminated by giving food and insulin, because of unfavourable symptoms. At this time the dog weighed 7 kg. It was placed on the retired list and raw pancreas was added to its food, in view of the observations of Allan, Bowie, Macleod, and Robinson[2] that this addition prevents the occurrence of serious and often fatal hepatic changes in insulin-treated, depancreatised animals. An amount of sugar considerably exceeding the assimilation limit was also given daily, so that marked glycosuria was always present. This was done in order to avoid risk of the development of hypoglycæmic symptoms in the night, from which other animals had been lost. On Oct. 12th, 1926, the weight had increased to 10·8 kg., and the only fact worth recording during the interval is that the dog on several occasions was mated while in heat, but did not become pregnant. It was now being fed twice daily with 200 g. raw lean meat, 50 g. raw pancreas, and 50 g. cane sugar, and 16 units of insulin were injected before each feeding. A conditioned salivary reflex had become established, so that whenever the attendant approached the cage with the hypodermic syringe in his hands the animal pressed its body against the bars and salivated profusely in anticipation of the feeding which was to follow. From Oct. 12th to 15th, the 24 hours' urine was collected and respiratory observations were made on the 12th and 14th. The average daily excretion of nitrogen was 13·9 g., and of glucose 82·3 g. Assuming that a D : N ratio of 3·65 would have obtained if protein alone had been metabolised, the total glucose intake works out at 156 g. (51 g. from protein and 105 g. from cane sugar), so that 74 g. of glucose was used, and the glucose equivalent † of one unit of insulin was 2·3. On Oct. 6th and 14th the respiratory quotient was 0·86 and the energy expenditure 69 calories per kg. and day; on the 15th these values were 0·83 and 74·5 respectively. There were no ketone bodies in the urine.

About a year later, on Sept. 27th, 1927, another similar metabolic study was conducted by J. J. Weber, the animal during the interval being on the above diet and always in apparently normal condition, very lively and vociferous. At this time it weighed 11·2 kg. Urine was collected daily until Oct. 6th, the average daily excretion of nitrogen being 11·2 g. and the carbohydrate utilisation 136 g., giving a glucose equivalent of 4·25. On Sept. 29th the respiratory quotient was 0·922 and the energy expenditure 78·5 calories per kg. and day; on Oct. 27th these values were 0·904 and 72·3 calories respectively. As judged from the behaviour of both the glucose equivalents and the quotient, the animal was utilising more carbohydrate than it had done a year previously. Similar metabolic studies were again undertaken by Mr. Weber from Oct. 31st to Nov. 4th, and from Nov. 29th and Dec. 6th, with the results given in Table I.

TABLE I.

1927.	Weight.	Average daily nitrogen excretion.	Average daily glucose utilised.	Glucose equivalents.
	kg.	g.	g.	
Oct. 31st to Nov. 4th.	13·5 to 12·5	13·54	143·4	4·3
Nov. 29th to Dec. 6th.	14·1 to 11·3	13·6	117	3·65

Respiratory analyses were made on two of the days of each period, the average quotient for the first one being 0·906 and the energy expenditure 71·7 calories per kg. and day; for the second period these values were 0·917 and 69·4 calories respectively. No traces, either of ketone bodies or of albumin were found in the urine, which was tested for their presence daily.

2. Dog 32, a female Irish setter, weighing 7·27 kg., was depancreatised by Dr. Allan on Feb. 14th, 1924. The subsequent history of this animal up to March 24th, 1925, has already been published by Markowitz and Simpson.[3] [4] The most noteworthy incident during this period was that the dog became pregnant and gave birth on Jan. 1st, 1925, to six pups, three being born dead. The milk flow was good, and the mother suckled the three pups. On Jan. 2nd she developed marked symptoms of hypoglycæmia, and the blood-sugar was found to be 0·067 per cent. Prompt recovery was effected by injection of glucose. Since the dose of insulin and the food intake had not been changed, it was concluded that loss of sugar in the milk, which was

*The Oliver-Sharpey Lectures delivered before the Royal College of Physicians of London on April 29th and May 1st.

† This equivalent is obtained by dividing the grammes of glucose utilised by the number of units of insulin injected.

being secreted plentifully, was responsible for the hypoglycæmia. From now on the blood-sugar concentration was measured daily, and since it did not again reach a dangerously low level, no change was made in the standard diet or the dosage of insulin. On Feb. 1st, 1925, the pups were weaned, and during March the carbohydrate balance of the mother was determined for a period of a week. It is interesting to compare the results at this time with those obtained between Oct. 25th and Dec. 25th, 1924. This is done in Table II.

TABLE II.

Date.	Weight.		Average daily nitrogen excretion.	Average daily glucose utilised.	Glucose equivalent
	kg.		g.	g.	
1924.	Prior to preg.				
Oct. 25–26 ..	—		13·26	117	3·6
Nov. 24–26 ..	10·8		13·58	126	3·9
Dec. 9–11 ..	11·4	During	13·00	120·4	3·8
„ 16–18 ..	11·9	preg.	11·34	103·5	3·23
„ 22–25 ..	12·6		11·46	113·5	3·54
1925.					
March 3–7 ..	10·0	After	12·2	133·5	4·17
„ 22–24 ..	10·0	weaning.	12·4	121·7	3·8

As pregnancy advanced the excretion of nitrogen declined, due to retention of nitrogen by the fœtuses. At the same time there was a slight falling-off in the utilisation of glucose, which indicates that no significant amount of insulin could have been added to the maternal organism from the fœtal pancreas. After weaning, the carbohydrate balance was practically the same as it had been six months previously.

During the next 18 months the dog was maintained in a perfectly healthy state on the standard diet and the usual insulin dosage. She did not again become pregnant, although frequently mated while in heat. The urine always contained sugar. The next metabolic observation was undertaken by Dr. Chaikoff between Oct. 7th and 13th, 1926, when the dog weighed 12 kg. The average daily excretion of nitrogen was 14·6 g. and the glucose utilised was 126 g., giving a glucose equivalent of 3·9. The average respiratory quotient of two of the days was 0·885, and the energy expenditure 63·9 calories per kg. and day.

Between September and December, 1927, metabolic observations were undertaken by J. J. Weber on three occasions of one week each. The average results for each period were as shown in Table III.

TABLE III.

1927.	Weight.	Average daily nitrogen excretion.	Average daily glucose utilised.	Glucose equivalents.	R.Q.	Calories.
	kg.	g.	g.			per kg.
Sept. 30th–Oct. 6th.	13·0	13·5	134	4·2	0·876	64·5
Oct. 31st.–Nov. 9th.	13·4	15·0	143	4·4	0·903	60·3
Nov. 29th.–Dec. 6th.	13·8	14·45	119	3·7	0·909	60·1

The urine was always found to be free of ketones and protein. The morning blood-sugars on Dec. 9th and 10th were 0·440 and 0·440 per cent. respectively. It is clearly shown that no change had occurred in the assimilative power for carbohydrate, although a large proportion of the available sugar was metabolised.

The remarkable constancy in the metabolic balances over a period of several years in both these animals shows conclusively that no agency could have become developed in the body to alter the assimilative powers for carbohydrate.

The choice of diet was made in the light of various trials on other depancreatised animals. In the first attempts meat alone was fed, but although it was greedily consumed there was a steady fall in body-weight and symptoms of poor nutrition usually supervened. On this diet, however, Banting and Best [5] succeeded in keeping a dog in good condition for over two months, when it was killed. To prevent the emaciation, cane sugar was added to the diet (with corresponding increase in insulin dosage), but although this had the desired effect and animals could now be kept alive for periods up to eight months, they ultimately succumbed to a condition in which symptoms of acute jaundice were prominent; this was found on post-mortem examination to be associated with extreme fatty changes in the liver. There was also during life evidence of very imperfect digestion of the food, the fæces containing much undigested muscle-fibre besides large quantities of fat. Believing that the absence of pancreatic ferments, upon which this inadequate digestion obviously depended, might be related to the hepatic changes, it was decided to add raw pancreas (50 g.) to the daily diet. The resulting improvement, both in the condition of the fæces and the general well-being of the animals, was very striking. The experience of M. E. Hédon [6] corroborates ours, but that of Penau and Simonnet [7] does not. These workers succeeded in keeping a depancreatised dog for 740 days on insulin and a diet composed of meat, milk, and bread, with powdered lime. Hershey, in the Toronto laboratory, has been investigating this problem, and by feeding easily digestible fats, particularly lecithin, has succeeded in keeping several depancreatised dogs alive for considerably over eight months, but we must await his report before we can say whether healthy survival is possible without administration of pancreas. My impression is that dogs may vary and that their ability to survive is related to the presence or absence of nodules of pancreatic tissue in the submucous layers of the duodenum. Bowie [11] has found that, in about 50 per cent. of both normal and depancreatised dogs, pancreatic nodules can be detected in the duodenal wall, closely associated with the pancreatic ducts. These nodules do not contain islet tissue, but they may secrete into the intestine just sufficient pancreatic juice to have a favourable effect on digestion.

The fattening effect of insulin and sugar is usually very marked in depancreatised animals, and was early noted in rabbits that were repeatedly used for the assay of insulin, especially when sugar had also to be given because of convulsions. In normal animals, however, the fattening does not continue for long, even although the insulin and sugar are continued, as we have shown by carefully controlled observations on pigs at the Rowett Institute (Magee, Macleod, and Middleton [11a]). In animals of sub-normal weight, on the other hand, the treatment may be of value.

PREGNANCY DURING DIABETES.

Our failure to detect any influence of pregnancy on the diabetic symptoms of dog 32 prompted Markowitz and Soskin [8] to repeat the observations on other animals with equally negative results. In two dogs that were depancreatised during the later stages of pregnancy, and thereafter given small doses of insulin, the partial diabetes which supervened was as severe as after pancreatectomy in non-pregnant animals. These results are apparently at variance with those obtained by Lawrence [9] in the case of a diabetic woman. During the first 27 weeks of the pregnancy the diabetes was severe, and the patient required 44 units of insulin a day, but it improved greatly during the following 10 weeks, at the end of which Cæsarean section had to be performed on account of nephritis. Just before the delivery (of twins) the carbohydrate tolerance had increased so far as to make it unnecessary to give insulin, and Lawrence computed that 100 g. more of carbohydrate could be tolerated than before the pregnancy. After delivery the diabetic condition became worse again. The record certainly sustains the view that the

fœtuses from the twenty-eighth week on were contributing sufficient insulin to combat the diabetic symptoms in the mother, and it also gives evidence to show that their secretory powers became stimulated when the percentage of sugar in the mother's blood was raised by the administration of sugar.

It is difficult to reconcile these conflicting results. There are, however, at least two points of difference between our experiments and the observations of Lawrence. These are: (1) the dogs were completely depancreatised, whereas the patient was still in possession of some islet tissue; and (2) the dogs were receiving relatively much more insulin *plus* carbohydrate than the patient. In the light of what we now know regarding the variations which may occur in the control of the internal secretion of insulin, it is quite possible that the remaining healthy islets of the mother's pancreas were stimulated to secrete more insulin, and that regeneration of new islets occurred as the pregnancy advanced. That this may have occurred is at least suggested by the fact that for some time after delivery the diabetic symptoms of the mother were less severe than they had been during the earlier weeks of the pregnancy. But they ultimately returned, which would seem to indicate that a temporary improvement in the secretory function of the maternal pancreas was responsible for the amelioration. On the other hand, evidence supporting the view that the fœtal insulin had benefited the mother in Lawrence's case is found in the fact that the blood-sugar at the time of delivery was much lower in the fœtal than in the maternal blood. The second difference may explain why we were unable to demonstrate any fœtal contribution of insulin, for it is well known that when insulin is relatively in excess of the carbohydrate turnover the addition of each extra unit has a much lesser effect than otherwise.

COURSE OF DIABETES ON WITHDRAWING INSULIN FROM TREATED ANIMALS.

The observations were undertaken by Dr. Soskin, and the results of the urinary and respiratory analyses are given in Table IV.

It will be observed that dog 23 was somewhat lighter than she had been a few months earlier—11·4 kg. as compared with 14·1 kg.—but that dog 32 had practically maintained her weight and was much heavier than when she first came under observation. Both animals were decidedly fatter than the average. As has already been remarked, neither showed symptoms of any kind until within a short period of death. The results of the metabolic studies were exactly what was expected in the light of those obtained from the numerous other fattened diabetic animals which have been observed in the Toronto laboratories, and they stand out in sharp contrast with those obtained on lean animals which will be dealt with later.

The D : N ratio of dog 23 on the second day after removal of insulin stood at 6·01, and that of dog 32, on the third day, was 4·12. On the following days, in the case of both animals, respiratory observations were made during the forenoon; sugar was then given and the respiratory measurements continued during the afternoon. A small but decided rise occurred in the respiratory quotient, and a small but variable proportion of the sugar reappeared in the urine. The total ketone excretion in dog 32 was of about the same magnitude per kilogramme body-weight as the largest reported in man (0·45 g. per kg. for man), and it was not demonstrably affected by the ingestion of sugar, although this probably was responsible for the ketone excretion not rising to higher levels than it did. Unfortunately, the blood was not examined.

TABLE IV.—*Dog No. 23.*

Date.	Weight. Kg.	O_2 consumption c.cm. per kg. hr.	CO_2 production c.cm. per kg. hr.	R.Q.	Urinary sugar output g. per 24 hrs.	Urinary nitrogen output g. per 24 hrs.	D : N ratio.	Total ketones in urine g. per 24 hrs.	—
Jan. 28.	11·4	—	—	—	47·15	8·31	5·67	Trace.	Last food and insulin 8.30 A.M.
,, 29.	—	—	—	—	57·42	5·48	10·47	0·103	Catheterised 9 A.M.
,, 30.	—	—	—	—	50·16	8·18	6·01	1·319	—
,, 31.	10·0	591 629	Before sugar. After sugar.	0·673 0·706	53·01	7·45	7·17	2·906	40 g. sucrose 12.40 P.M.
Feb. 1.	9·7	—	—	—	28·03	8·59	3·27	2·687	—
,, 2.	9·4	613	Before sugar.	0·702	—	—	—	—	Died 10.45 P.M.
								0·28 per kg. man 0·55	
Dog No. 23. (preg.).									
Jan. 28.	13·4	—	—	—	85·00	8·42	10·20	Trace.	Last food and insulin 8.30 A.M.
,, 29.	—	—	—	—	36·20	5·91	6·29	0·946	Catheterised 12·45 P.M.
,, 30.	—	—	—	—	31·68	7·42	4·27	3·989	—
,, 31.	12·0	—	—	—	27·00	6·55	4·12	5·491	—
Feb. 1.	11·0	493 618	Before sugar. After sugar.	0·697 0·714	53·80	6·44	8·34	5·080	40 g. sucrose, 12.55 P.M.
,, 3.	—	—	—	—	—	—	—	—	Died 12 noon.

Dog 23. Sample 1. Muscle glycogen .... 0·111 per cent. Liver glycogen .... 0·029 per cent. Liver fat .... 44·31 per cent.
Dog 23. Sample 2. Liver glycogen .... 0·049 per cent. Liver fat .... 44·24 per cent.
Dog 32. Muscle glycogen .... 0·16 per cent. Liver glycogen .... 0·052 per cent. Liver fat .... 41·9 per cent.

At post-mortem examination it was found that pancreatectomy had been complete in both animals. The duodenal wall adjacent to the bile and pancreatic ducts was examined microscopically by Drs. D. J. Bowie and W. L. Robinson. No pancreatic tissue could be detected in the case of No. 23, but a small piece embedded in the submucosa was found near the stub of the chief pancreatic duct in No. 32. This measured 2 mm. by 3 mm., and apparently had no duct connexion with the intestine. Only a few of the cells composing it contained violet-staining granules, probably zymogen. A most careful search, in which the special staining methods previously described by Bowie were used,[10] failed to reveal any islets. It may be remarked that this was to be expected, in view of our experience with numerous similar pancreatic nodules in other animals (cf. Bowie [11]). There was much subcutaneous and mesenteric fat, especially in No. 32. All the organs appeared to be healthy on naked-eye examination, but the liver was large and pale. Microscopic examination did not reveal anything of note, except that the liver cells were very large and vacuolated, and the circular muscle-fibres of

TABLE V.

	Sample.	Dog 23. Per cent.	Dog 32. Per cent.
Muscle glycogen	1.	0·111	0·16
Liver glycogen	1.	0·029	0·052
	2.	0·049	0·061
Liver fat	1.	44·31	41·9
	2.	44·24	41·9

the aorta were swollen and shreddy in appearance. In the latter also, areas were noted in which gelatinous changes, leaving open spaces, had occurred. There was no hardening of the arteries. Chemical analysis was made of the muscles for glycogen and of the liver for glycogen and fat.

The results were as given in Table V. The very low glycogen and the high fat content of the liver are noteworthy.

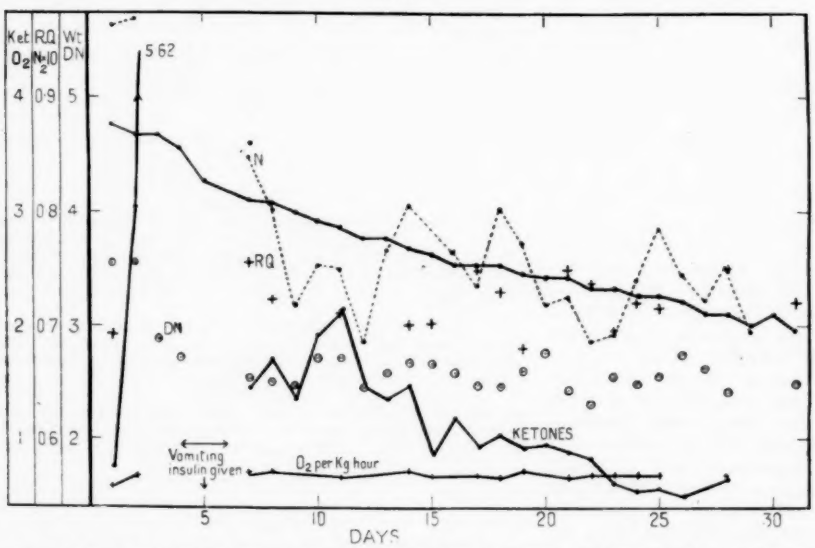
When we bear in mind that the normal span of life of a dog is 12–15 years and that of a man 60–70, we may assume that the four years during which both these completely depancreatised animals lived would correspond to 20 years in the case of man, and undoubtedly, had the insulin treatment not been discontinued, the dogs would have survived much longer. None of the symptoms of cataract, of gangrene, of arterio-sclerosis or of nephritis, which some have supposed may supervene after the blood-sugar has been supernormal for some time, was manifested by either animal.

The Course of Pancreatic Diabetes when Food but No Insulin is Given.

In view of the great accession to our knowledge of diabetes which resulted from von Mehring's and Minkowski's discovery that this disease follows experimental removal of the pancreas, it is surprising that the number of complete records of the condition is not large. The literature is surfeited with accounts of the symptoms and the clinical history of diabetes mellitus in man, but, although these accounts have given useful guidance in its diagnosis and dietetic treatment, they have not taught us as much as have the experimental investigations concerning either the fundamental cause of the disease or its rational treatment. The reason for this is probably because the most severe cases in man are never completely diabetic (cf. Joslin,[12]) there being always some more or less undamaged islet tissue left in the pancreas. Not only will the insulin which this secretes prevent diabetes from developing to its full intensity but—and this is more serious from the scientific point of view—the secretion will not be constant from day to day. These variations in the internal secretion of insulin have been responsible for many errors of judgment regarding the efficacy of this or that therapeutic measure in treating the disease. From time to time, for example, various substances have been advocated as antidiabetic remedies because they brought about some diminution in the glycosuria or seemed to effect a temporary improvement in the clinical condition. In some countries local plants have for long had a reputation as remedies, more especially those of the myrtle family. But so long as some islet cells remain functional it is most likely that any beneficial action which such substances may temporarily display is due to their stimulating influence on the secretion of insulin, and it is evident, if this be the case, that their prolonged administration must be detrimental, since over-stimulation of the already weakened islets will lead to exhaustion and to further decay. On several occasions I have had sent to me various of these reputed remedies with such assurances of their efficacy from the clinical standpoint that I have investigated their action on depancreatised dogs, the invariable result being that they had no effect on the diabetic symptoms. They did not alter the symptoms in complete diabetes, although they may have temporarily alleviated them in the incomplete form of the disease as met in man.

In view of these facts it is clear, I think, that experimental pancreatic diabetes must be regarded as the final court of appeal in giving a decision as to whether any drug or other remedial measure should be used in the treatment of diabetes in man. And I would further insist that the reputed remedy must be capable not only of removing the symptoms of the disease but also, by its repeated administration, of maintaining the animal in normal condition, as we have seen insulin can do. Since, therefore, the depancreatised animal is indispensable in the investigation of the problems of diabetes, it is important that we know precisely for how long it may live and the behaviour of the symptoms when no remedial measures are taken. Dr. Soskin[13] has just completed an investigation along these lines at Toronto, and, with his permission, I will refer to some of the most important facts which he has brought to light.

FIG. 1.



Curves showing the behaviour of body-weight, excretion of nitrogen and ketone bodies, respiratory quotient, D:N ratio, and the oxygen consumption in a depancreatised animal during a period of a month after removal of insulin. The values for the various curves are indicated in the columns along the ordinates. Time in days is given on the abscissa. + = R.Q. ⊙ = D:N ratio.

After depancreatisation, the animals were treated with insulin for some weeks before the observations were started. They were all apparently in good condition when the insulin was withdrawn, and none of them was excessively fat. As we have seen, fattened animals never survive for more than five or six days after removal of insulin, so that they would have been unsuitable for one of Dr. Soskin's main purposes, which was to see for how long a depancreatised animal can remain alive without insulin, but with every other care. In all cases food (meat, gelatin,

and casein) and water were allowed throughout the observation, although several of the animals refused to take the former. The urine was collected daily and the amounts of glucose, nitrogen and ketone bodies in it were determined. On certain days also the animals were placed, usually for periods of two or three hours each, in a respiratory apparatus of the Benedict type. I have described this apparatus elsewhere,[13a] and need only remark here that its accuracy was proved periodically by burning measured amounts of alcohol in it.

The observation, of which the results are shown in the curves of Fig. 1, is the most complete we have on record. The animal took food (300 g. lean meat, containing therefore 60 g. protein and 30 g. fat) throughout, and excreted several grammes of nitrogen less than was contained in the food, owing, no doubt, to imperfect digestion and absorption in the absence of a secretion of pancreatic juice. The very considerable variability in the nitrogen excretion is probably also to be related to the faulty digestion. The D : N ratios after the first week averaged about 2·6, but varied somewhat from day to day, and it is interesting to note that they ran more or less parallel with the nitrogen excretion, a relationship which was also noted in other animals of the series. This would seem to indicate that increased protein metabolism was accompanied by the excretion of a greater proportion of the sugar derived from this source. The ketonuria started on the first day of the diabetes and became very high on the third and fourth when, indeed, vomiting, which in dogs is the first general symptom of coma, became so acute that insulin had to be administered in order to save the animal. After this the ketonuria gradually declined and although, no doubt, the administration of insulin was responsible for the inception of the recovery, it is significant that in other depancreatised animals not so treated the ketonuria usually attained a maximum about the fifth day, and then gradually declined without insulin. This stands out in sharp contrast with the course of the ketosis in fattened animals, which do not survive the coma unless treated immediately upon the appearance of its first symptoms. In only one case in the series, the results of which are given in the curves of Fig. 2, did severe ketonuria develop at a later stage. The respiratory quotient in the animal of Fig. 1 varied between 0·680 and 0·727, the higher quotients being caused by an increase in carbon dioxide expired rather than by a decrease in oxygen retained in the body. No relationship can be traced between variations in the quotient and the glycosuria or ketonuria.

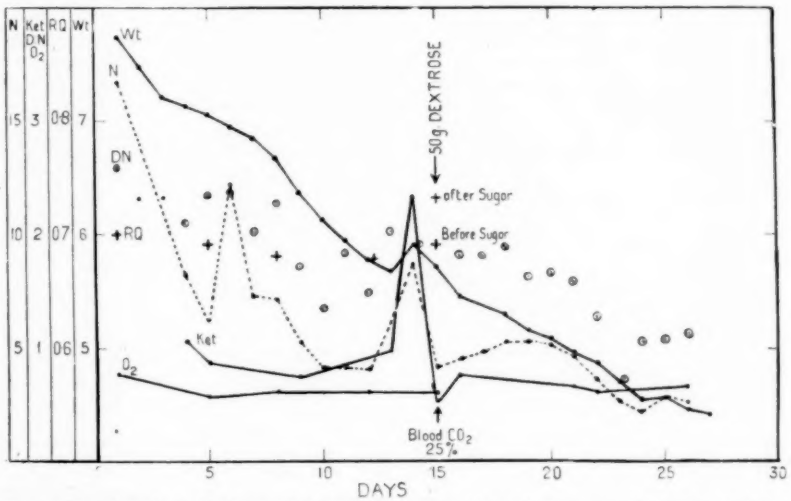
The second of the charts (Fig. 2) shows the course of the diabetic symptoms in an animal which did not regularly take its food. Towards the end of the second week of the observation, the ketonuria, which had previously been moderate, became very marked, and was accompanied by a great increase in the excretion of nitrogen and a fall in the percentage of carbon dioxide in the blood. Curiously enough, also, the body-weight at this stage increased for a day or so, but the notes do not indicate to what this was due. After the fifteenth day, on which sugar was given, the body-weight, the nitrogen excretion, and the D : N ratios all fell steadily until the twenty-sixth day, when the ratio was 1·14. The ketonuria and the carbon dioxide content of the blood remained steady.

The Significance of the D : N Ratio and the Respiratory Quotient in Diabetes.

Tables VI. and VII. are compiled from Dr. Soskin's protocols, and they show the most significant results obtained with regard to the D : N ratio, the respiratory quotient, the ketone body excretion, and the proportion of sugar recovered in the urine after sugar ingestion.

It is seen that after the third day of the diabetes the D : N ratios were usually at or slightly above

FIG. 2.



Curves showing the behaviour of body-weight, excretion of nitrogen and ketone bodies, respiratory quotient, D : N ratio and the oxygen consumption in a depancreatised animal during the period of a month after the removal of insulin. The values for the various curves are indicated in the columns along the ordinates. Time in days is given on the abscissa. + = R.Q. ⊙ = D : N ratio.

2·5 in four of the animals, including those of which the results are shown in the curves. In the remaining six animals the ratio was never over 2, and it varied considerably. Since there can be no doubt that extirpation of the pancreas was complete in every case, these results show the fallacy of taking the D : N ratio as a criterion of the intensity of the diabetes, as Markowitz and I pointed out several years ago.[14]

The behaviour of the respiratory quotient was also contrary to common belief. In phlorhidzin poisoning, as also in human diabetes, the quotient is between 0·660 and 0·707 when allowance is made for the protein metabolised. During the past few years it has been frequently measured in depancreatised dogs in the laboratory at Toronto, and has also been found at correspondingly low levels, at least during the week or so after removal of insulin, and we were greatly surprised when L. Hédon published results showing that much higher quotients may occur at later stages of the diabetes.[15] It was, indeed, partly to satisfy ourselves that this is really the case that the present observations were undertaken, and it can be seen that high quotients were observed in three of the nine animals in which respiratory observations were made. Confirming Hédon, it was found that the high quotients occurred at a late stage of the diabetes, and since an increase in carbon dioxide excretion rather than a decrease in oxygen-uptake was responsible for them, the question arose whether they might depend on a state of acidosis. Dr. Soskin therefore determined the alkali reserve of the blood (Van Slyke method) in many of the animals, but without finding that this bore any relationship to the high quotients. It is true that he sometimes found very low values for carbon dioxide—25·5 volumes per cent. in one case—but there was no apparent parallelism between this and the respiratory quotient. Hédon

suggests that, since the high quotients are most usually seen after the diabetes has existed for some time, they may be due to a loss of power by the liver to convert protein and fat into carbohydrate, a process which, by absorbing oxygen, would keep the quotient at a low level. He believes that combustion of what carbohydrate remains in the body is responsible for the higher quotient, but it is difficult to see how the energy thus derived could maintain the animal in life for more than a few hours.

TABLE VI.—DEPANCREATISED DOGS (SOSKIN'S OBSERVATIONS).
D : N's, R.Q.'s, and Ketones on selected days after withdrawing insulin.

No. of day.	Table 1.			2.		4.			5.			6.			7.	8.		9.		10.	
	D : N	R.Q.	K	D : N	R.Q.	D : N	R.Q.	K	D : N	R.Q.	K	D : N	R.Q.	K	D : N	D : N	R.Q.	D : N	R.Q.	D : N	R.Q.
1	—	0·75	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	—	—	—	—	—	—	—	1·01	—	—	—	—	—	—	—	—	—	—	—	—	—
3	—	0·69	—	3·4	0·68	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
4	—	—	—	2·5	0·68	2·3	0·73	—	3·3	0·70	—	—	—	1·1	2·3	—	—	—	—	—	—
5	—	—	—	—	—	—	—	—	—	—	—	2·35	0·69	—	—	—	0·75	3·3	0·69	2·5	—
6	—	0·71	—	—	—	—	—	—	—	—	1·35	—	—	—	—	1·9	—	—	—	—	—
7	—	—	—	—	—	2·3	—	—	2·9	—	—	—	—	—	—	1·6	—	—	—	—	—
8	—	—	—	1·8	—	—	0·71	—	—	—	—	2·30	0·68	—	2·8	—	—	—	—	—	—
9	—	—	—	1·5	0·68	—	—	—	—	—	—	—	—	—	—	—	0·92	1·4	0·67	—	—
10	—	—	—	†	—	—	—	—	—	—	—	—	—	—	—	Took some food.		—	—	—	—
11	—	—	—	—	—	1·3	0·80	—	—	—	—	—	—	—	2·5	—	—	—	—	—	—
12	—	—	0·39	—	—	—	—	—	2·9	—	—	1·5	0·68	—	Took food.	† (Infection).	—	2·4	0·69	—	—
13	1·98	0·83	—	—	—	—	—	—	2·3	—	—	—	—	—	†	—	—	—	—	—	—
14	—	—	—	—	—	1·6	—	0·14	—	—	0·56	1·9	—	2·3	—	—	—	—	—	—	—
15	1·30	0·90	—	—	—	—	†	—	—	†	—	—	0·69	—	—	—	—	—	—	—	—
16	—	—	—	—	—	—	—	—	Accident.			—	—	—	—	—	—	—	0·70	—	0·68
17	—	—	0·18	—	—	—	—	—	Took food.			—	—	—	—	—	—	—	—	—	—
18	—	—	—	—	—	—	—	—	—	—	—	1·9	—	—	—	—	—	—	—	—	—
19	Took food.			Refused food.		Took food.			—	—	—	—	—	—	—	—	—	2·5	0·69	—	—
21	—	—	—	—	—	—	—	—	—	—	—	1·6	—	—	—	—	—	—	—	—	—
23	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·71	—	—
24	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1·6	—	—	—
25	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	Took food.		—	—
26	—	—	—	—	—	—	—	—	—	—	—	1·1	—	0·70	—	—	—	—	—	—	—
30	—	—	—	—	—	—	—	—	—	—	—	Took some food.			—	—	—	—	—	—	0·70
31	—	—	—	—	—	—	—	—	—	—	—	—	†	—	—	—	—	—	—	2·2	—
33	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0·69
34	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1·9	—
37	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1·6 Took food.†	0·75

† Indicates that the animal died.

RECOVERY OF INGESTED SUGAR.

Perhaps the most interesting of the results were those relating to the extent to which administered glucose reappeared in the urine, and its effect on the respiratory quotient and the excretion of nitrogen. In every instance the ingestion of glucose caused an increase in respiratory quotient, and a decrease in the excretion of nitrogen (Table VII). The results confirm those of Wierzuckowski [16] (see also Deuel, Wilson, and Milhorat [17]), who also observed in phlorhidzin-poisoned dogs that the rise in respiratory quotient was particularly well marked when the glucose was given in two portions, one an hour or so after the other, a procedure which was followed in many of the present experiments.

TABLE VII.—EFFECT OF SUGAR ON DEPANCREATISED DOGS.

No.	Day	Glucose administered.	R.Q. Preceding Administration.	R.Q. After Administration.	Nitrogen. Preceding.	Nitrogen. After.	Glucose recovered.*	Glucose used (per cent.).
		g.					g.	
4	8	50	0·707	0·735	17·5	13·1	40	20
	15	50	—	0·805	15·02	13·2	26	48
5	7	50	0·696†	0·759	—	—	—	—
	11	50	—	0·765	12·75	9·09	21·7	56·6
6	15	50	0·691	0·732	8·54	4·23	43·0	14·0
7	12	25 + 25‡	—	—	10·82	4·66	32·5	35·0
9	9	50 + 50	0·668	0·709	22·93	23·96	55·3	44·7
	12	50 + 50	0·690	0·722	26·58	23·73	82·6	17·4
	19	50 + 50	0·687	0·750	25·15	22·58	87·8	12·2
	23	50 + 50	0·714	0·813	20·95	16·32	36·35	63·6
10	33	25 + 25	0·691	0·771	10·44	11·01	19·23	61·6
	37	25 + 25§	0·754	0·853	—	—	—	—

* Calculated by usual method allowing for fall in nitrogen. † Taken several days previously. ‡ Died on 13th day. § Died on 38th day.

Much of the ingested sugar reappeared in the urine, and a rough general parallelism can be seen between the proportion which reappeared and the extent of the rise in respiratory quotient. Although calculations in metabolism are treacherous unless all the data have been observed over long periods of time, it is nevertheless often useful to attempt them with the shorter period data, on the assumption that the latter correspond to what the former would have been. On this basis we may calculate from the amount of sugar utilised the extent to which the quotient would be expected to rise.

Thus on the twenty-third day of Experiment IX., when the most marked rise in respiratory quotient occurred, the oxygen consumption per kg. body-weight and per hour before sugar was 723 c.cm., or 128·4 litres in 24 hours, and the quotient, 0·714 (cf. Soskin's tables [13]). According to the Zunz-Lusk tables, this means that the total heat production was 603·5 calories, and that 3 per cent. of carbohydrate was used to produce it, equalling 18 calories, or 4·3 g. of carbohydrate. After sugar the quotient rose to 0·813, which means that 36 per cent. of the energy came from carbohydrate and, assuming that this level was maintained, then, during a period of eight hours, 43·2 litres of oxygen were used, or $43·2 \times 4·82 = 208$ calories, or 50·8 of carbohydrate. The excess consumed, according to the respiratory analysis, was, therefore, somewhere about 47 g., whereas actually 63·6 g. of glucose disappeared.

The most important result of the research is that both the respiratory quotient and the sugar balance show definitely that the completely diabetic animal is capable of oxidising large amounts of carbohydrate and, this being so, it is not surprising that the excretion of nitrogen should fall decidedly. Thus one more nail is put in the coffin of the long moribund

and now quite dead theory that diabetes is due to a loss of power by the tissues to oxidise carbohydrate. This power may be depressed, as I have elsewhere pointed out,[21] but this depression is probably secondary to other disturbances of metabolism.

Comparison of Diabetes in Fat and Lean Depancreatised Dogs.

The differences in the course of pancreatic diabetes in lean and fattened dogs are very striking; the most important are as follows:

Fat animals.	*Lean animals.*
Death usually occurs about the fifth day, preceded by symptoms of vomiting, coma, and anhydræmia.	Animals may live for over a month. Vomiting may appear about fifth day, but animals usually recover.
After coma appears, treatment with insulin sometimes fails to prevent death.	Symptoms very readily removed by insulin.
Hyperglycæmia very marked.	Hyperglycæmia moderate.
Ketonæmia marked.	Ketonæmia not so marked.
D : N ratio after third day usually above 3·65.	D : N ratio much lower and may be well below 2 by the second week.

The diabetes is in every regard far more acute in the fattened animal, and the relatively more marked hyperglycæmia as well as the higher D : N ratios strongly suggest that fat must be a source of some of the sugar. This hypothesis is also supported by the following observations:

1. The D : N ratio on the fifth day in fattened depancreatised dogs often exceeds 5 : 1 after making allowance for the glucose which might theoretically be derived from the glycogen stores of the liver and muscles (cf. Chaikoff [18]).

2. Repeated injection of epinephrin may cause considerably more extra glucose to be excreted than can be accounted for after making allowance for that derivable from glycogen and protein (Chaikoff and Weber [19]).

3. Excessive ingestion of fat may cause an excretion of extra glucose which exceeds that derivable from glycogen and protein (Soskin [20]).

I have discussed elsewhere the further evidence which indicates that gluconeogenesis is not restricted to protein (Macleod [21] and Macleod and Gottschalk [22]), and will only add here that the two criteria upon which the denial of this hypothesis rests—namely, the constancy of the D : N ratio and of the respiratory quotient in completely diabetic animals are definitely shown by our researches to be unsound. These ratios are undoubtedly constant under strictly standardised conditions in animals poisoned by phlorhidzin, but this is not true diabetes, since insulin is still available in the body of the animal. Finally, it should be pointed out that the conclusion that fat may form sugar in the animal body is also supported by numerous clinical observations on diabetes mellitus, which have been admirably summed up by Geelmuyden.[23]

BIBLIOGRAPHY.

1. Sokhey, S. S., and Allan, F. N.: Biochem. Jour., 1924, xviii., 1170.
2. Allan, F. N., Bowie, D. J., Macleod, J. J. R., and Robinson, W. L.: Brit. Jour. Exp. Path., 1924, v., 75.
3. Markowitz, J., and Simpson, W. W.: Trans. Roy. Soc. Can., 1925, xix., Sec. v., 71.
4. Macleod, J. J. R.: Monographs of Physiology, Carbohydrate Metabolism and Insulin. Longmans Green. London, 1925, p. 83.
5. Banting, F. G., and Best, C. H.: Jour. Lab. and Clin. Med., 1922, vii., 3.
6. Hédon, M. E.: Jour. Physiol. et Path.-gén., 1927, xxv., 1.
7. Penau, H., and Simonnet, H.: Ann de Méd., 1926, xix., 401.
8. Markowitz, J. and Soskin, S.: Amer. Jour. Physiol., 1926, lxxix., 553.
9. Lawrence, R. D.: Quart. Jour. Med., 1929, xxii., 191.
10. Bowie, D. J.: Anat. Rec., 1924, xxix., 57.
11. ,, ,, ,, : Trans. Roy. Soc. Can., 1926, xx., Sec. v., 19.
11A. Magee, H. E., Macleod, J. J. R., and Middleton, W.: In press, Biochem. Jour.
12. Joslin, E. P.: The Treatment of Diabetes Mellitus, 1928, 4th ed., Philadelphia and New York.

(*Continued at foot of next column.*)

THE MEDICAL TREATMENT OF CANCER.*

By A. T. Todd, M.B. Edin., M.R.C.P. Lond.,

HON. ASSISTANT PHYSICIAN TO THE BRISTOL ROYAL INFIRMARY.

Although there is no medical treatment of cancer at present, or no medical system which will ensure regression of malignant growths in a high percentage of cases, the title of this lecture was chosen deliberately. It was hoped that the surgeon might be impressed from the outset with the fact that medical or medicinal treatment may really be of value.

The attitude of the medical profession to cancer is rather peculiar; it is, perhaps, the only disease, as differentiated from malformation or injury, which has been handed over to the surgeon without reserve. Physicians explain this by saying that medical treatment is ineffective, and is likely to be so until the cause is known, when some vaccine or serum therapy may become possible. This attitude is rather deplorable, for though the cause of cancer may be discovered, it is quite likely that the discovery may not help much more than the discovery of Koch's bacillus has helped the treatment of tuberculosis. A comparison of cancer as a disease with tuberculosis is justifiable; there are some strong similarities. Sixty years ago tuberculosis was regarded by some as probably neoplastic, and there were almost as many theories as to its cause and so-called types as there are for cancer now. We know the cause of tuberculosis now, and can reproduce the disease; but most of us have stopped trying to treat the disease; we treat the patient instead, to his benefit. Cancer may turn out to be similar; we have been treating the disease as intensively as possible, and the results are well known. May it not be well to follow the programme of other chronic diseases, and try treating the patient? May he not have the disease because of some metabolic or other abnormality of which the relationship is obscure at present?

Lead Selenide.

This research was commenced in 1925, shortly after the revival, or rehabilitation, of the lead treatment of cancer was brought about at Liverpool. Lead is an old remedy for cancer; Ambroise Paré used it with success, and we (the plural used to include the team) have obtained some results from a modification of his method.[1] As there had been signs of promise from selenium in cancer, it was considered that the union of lead with selenium might give better results than lead alone. A colloidal lead selenide was made and, after careful testing on

* A lecture and demonstration of cases delivered to the British Association of Surgeons at Bristol, on May 2nd, 1930.

Bibliography continued from previous column.

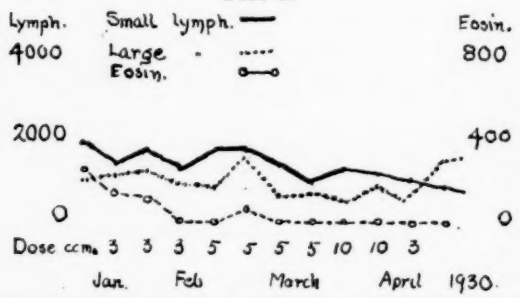
13. Soskin, S.: In press, Jour. of Nutrition.
13A. Macleod, J. J. R.: Jour. Lab. and Clin. Med., 1929, xiv., 1175.
14. Macleod, J. J. R., and Markowitz, J.: Trans. Assoc. Amer. Physicians, 1926, xli., 147.
15. Hédon, L.: Arch. internat. de Physiol., 1926, xxvii., 254.
16. Wierzuckowski, M.: Jour. Biol. Chem., 1926, lxviii., 385.
17. Deuel, H. J., Wilson, H. E. C., and Milhorat, A. T.: Jour. Biol. Chem., 1927, lxxiv., 265.
18. Chaikoff, I. L.: Jour. Biol. Chem., 1927, lxxiv., 203.
19. Chaikoff, I. L. and Weber, J. J.: Ibid., 1928.
20. Soskin, S.: Biochem. Jour., 1929, xxiii., 1385.
21. Macleod, J. J. R.: The Fuel of Life, 1928, Princeton Univ. Press.
22. Macleod, J. J. R., and Gottschalk, A.: Ergeb. der Physiol., 1930.
23. Geelmuyden, H. Chr.: Ergeb. der Physiol. (1923–30), xxi., xxii., xxiv., xxvi., xxx.

animals, used for man. Fortune was kind to us, for our first few cases happened to be more than usually susceptible to this treatment; thus we were encouraged to continue.

A new method is often successful at the start. Trousseau said: "Let us make haste to use this remedy while yet it cures." In order not to be misled, we made the test as difficult as we could; we accepted for treatment only advanced and completely inoperable cases. The only choice of cases was certification that nothing could be done, and that the patient was not actually moribund. A leader in experimental medicine said, when this programme was outlined to him, that if we were successful in 1 per cent. of cases we would have done much; we can definitely show more than that. But if I am asked for exact percentages and statistics I am unable to give them. It is impossible to give percentages on about 100 cases, for though we have treated more than this, for various reasons, only about 100 are worthy of scrutiny. Moreover, how shall we warp statistics to show relief of pain, prolongation of life and, more important—the gratification of the patient given hope and action instead of a passive expectancy of death?

We do not expect to cure the cases we have chosen to treat. The late advanced case, riddled with metastases and often with involvement of vital structures is not the type of case on which to base encouraging statistics. Even though the cancer were removed, the cicatrisation of repair would probably kill more quickly than the cancer. We chose these cases to demonstrate the utility, or otherwise, of this treatment in producing relief of pain, euphoria of the patient and regression of the cancer; then, when a technique was learned, we should hope to apply the method to earlier cases, with less widely spread growth, and therefore some hope of survival. There are several valuable monetary prizes for the discoverer of a cure for cancer, but it is

FIG. 1.



Leucocyte count, absolute, of non-reactive case. Alteration of the dose did not affect the leucocytes.

probable that these prizes will never be awarded; though the cancer may be got rid of, the patient dies. We have records of a tolerable number of cases of widely spread cancer treated by this method in which at autopsy little or no growth was found. Until diagnostic methods have improved to the degree at which late cancer is a rarity, there is no point in attempting more; for, though a remedy more active than ours is found, it could not be accepted as a cure, for these late cases would die the quicker from its use.

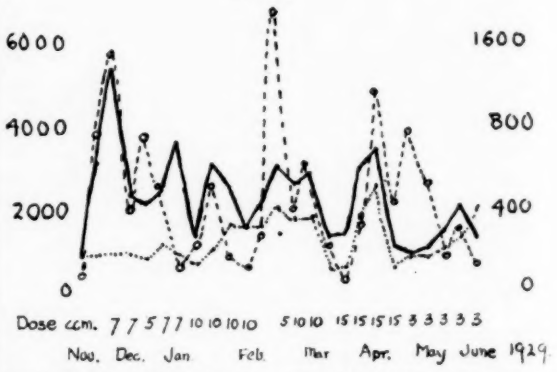
To give a brief example; a patient with a large, bleeding, sarcoma of the lower dorsal spine was one of the first treated. We gave a large first dose, and were gratified to see the bleeding stop and the mass shrink. About a week later we doubled the dose, and the visible mass became gangrenous. As it extended into the peritoneum, the patient died; at the autopsy only one or two small masses had escaped gangrene—i.e., the remedy was excellent, but the patient died of it.

Throughout this research our programme has been to develop a technique with the hopeless cases, then apply the method as an addition to the present surgical and radiological treatments.

THE PREPARATION USED.

As the technique of the treatment has been published,[2] only a brief summary need be given here. The preparation we use is available to all, being a

FIG. 2.



Leucocyte count of reactive case. The lines and figures have the same significance as in Fig. 1.

0·4 per cent. sol of lead selenide, manufactured by British Drug Houses, Ltd. It is labelled D4S, and no profit from the sale of colloid or of the monograph is made by any member of this research team. No patient, though some have been wealthy, has been allowed to pay any fee for treatment. I have been asked why one firm is allowed a monopoly; the reason is that we were able to teach one firm the very exact method necessary to produce a non-toxic colloid; we could not hope to publish a description accurate enough for any chemical manufacturer to use.

The colloid is of low toxicity when made in the proper manner; a rabbit will tolerate 4 c.cm. per kilogramme. It is not possible to state the lethal dose for an adult human, but as much as 33 c.cm. has been given in one dose without adverse effects. The toxicity does not appear to depend upon the colloid directly; adverse effects, such as temporary increase of pain around the neoplasm and pain about the sacrum appear to be proportional to the amount of action on the neoplasm. These reactive effects are considered to be due to protein poisoning from breakdown of cancer tissue. Symptoms of toxic action of lead are unusual, colic is seldom observed. Immediate shock-like reactions are seen occasionally; they are similar to the crises observed after injection of preparations of any of the heavy metals. These immediate crises are readily prevented by administration of ephedrine hydrochloride and adrenalin just before the injection.

DOSAGE.

The size of the initial dose depends upon the nature of the neoplasm. From our experience we divide neoplasms into two classes:—

1. Likely to be *resistant:* squamous carcinoma of lip, tongue, vulva, skin generally; adenocarcinoma of breast; carcinoma of cervix; carcinoma of rectum. For these an initial dose of 5 c.cm. is given.

2. Likely to be *sensitive:* any neoplasm which has recently been radiated with gamma rays; sarcoma; endothelioma; carcinoma of ovary; hypernephroma;

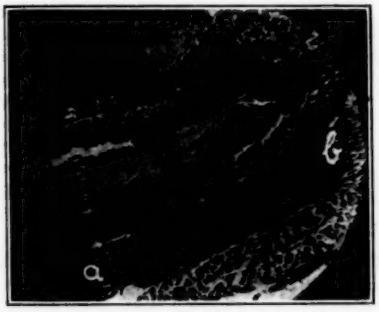
primary or secondary carcinoma of liver or kidney. For these an initial dose of 1 c.cm. is given.

We give the colloid intravenously at weekly intervals. The size of the later injections depends upon the amount of focal and general reaction, for this, as was said above, appears to be proportionate to the amount of action on the neoplasm. A definite, appreciable reaction is desired, it should last for about 24 hours and comes on from 6 to 48 hours after the injection; the time of onset of reaction varies from patient to patient, but is fairly constant for a single patient. When the reaction has passed there is usually a feeling of well-being with increase of appetite and diminution of pain; some of the patients describe it as a tonic action. We increase the size of the injection by 1 or 2 c.cm. in sensitive neoplasms, and 2 to 4 c.cm. in non-sensitive neoplasms, until we find the maximum dose which is followed by a satisfactory clinical and hæmatological reaction; that dose is then maintained. We claim that the treatment has a favourable action in the majority of the cases; it is estimated that in about one-fifth of the patients there is no appreciable result, but in the remainder more or less improvement is found to follow.† If the treatment is given haphazard and in large injections there will be only unfavourable results. We tried maximal doses for a time, that is, we gave the patients as much as they would stand; the result appeared to be an increase in the rate of growth of the cancer. Too small doses might have the same effect. We claim that the treatment is good, but the explanation of its action is not yet proved.

THE REMEDIAL EFFECT.

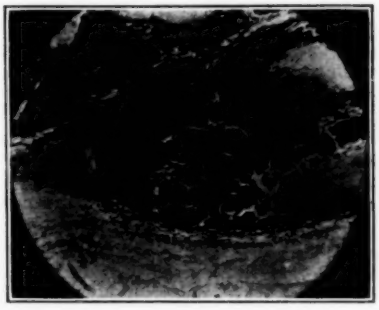
As with all new remedies a specific, or immediate, action on the cancer cell was considered to be the explanation. The Liverpool school pointed out certain resemblances in the cells of certain neoplasms to certain cells of the decidua, and correlated the known abortifacient action of lead on the decidua with this. They considered that the preparation of lead which they used was taken up by the cancer cell and the ingested lead occasioned the death of the cell. This theory was not accepted in Bristol, for we found that the more of this supposed cancer cell poison we gave, the quicker was the growth of the cancer; then tissue analyses always showed that there was less metal lead in the cancer than was found in the normal tissues. Since every so-called specific remedy is found later to have an indirect action, we considered that lead selenide would also act indirectly. Examination of the blood, originally undertaken to guard against anæmia and other toxic manifestations, showed that there was a definite sequence of changes after injection. In the cases which showed response we found that the small lymphocytes and eosinophil leucocytes of the blood showed an increase; while in cases which did not respond this blood change was not observed (Figs. 1 and 2). In addition, we found that the normal fat-splitting enzyme of the blood, which was usually increased in late cancer, showed a diminution when the treatment was being effective.

FIG. 3.



Twort adenocarcinoma. Junction tissue appears as a well-marked belt **a—b**. The same amount of metal lead (but as guaiacolate, not selenide) and radium as in Fig. 4. Necrosis of the superjacent cancer is almost complete.

FIG. 4.



Twort adenocarcinoma. Absence of junction tissue, presumably from gamma radiation after selenide. Necrosis of cancer is trivial. Cf. Fig. 3.

It would take a long time to go into the many possibilities and give explanations as to what these cell changes might signify; to condense, it is considered that lead selenide is a stimulus to the defence which is put up against the irritation or invasion of a malignant neoplasm. The cellular defence, if it exists, is familiar to the pathologist as a more or less imperfect barrier of lymphoid and plasma cells, fibroblasts, eosinophil and basophil cells, and that endothelial cell which has many names, but is best called the macrophage. In slowly growing cancers this surrounding, or junction tissue, is abundant, and it is conceivable that it is a barrier; in rapidly growing cancer the junction tissue is scanty, and perhaps this is the reason for the rapidity of growth. On the other hand, it can be argued that the poverty in junction tissue in rapidly growing neoplasms is due to the lack of time for junction tissue to develop.

We have fairly definite evidence that this treatment increases the lymphocytes, plasma cells and eosinophil leucocyte of the blood. We know that any electro-negative colloid, of which D48 is one, will tend to increase the activity of the macrophages. We find that hyperplasia of fibrous tissue frequently follows to an embarrassing degree, for in cases of extensive cancerisation of the peritoneum, this fibrous hyperplasia often kills the patient from stenosis of ureter or intestine. Though we do not say that the cells of the junction tissue are derived from the cells of the blood stream, and that increase of lymphoid cells in the blood will be followed by an increase round the neoplasms, yet the stimulus which causes increase in the one place might be expected to cause an increase in the other.

Chemotherapy plus Irradiation.

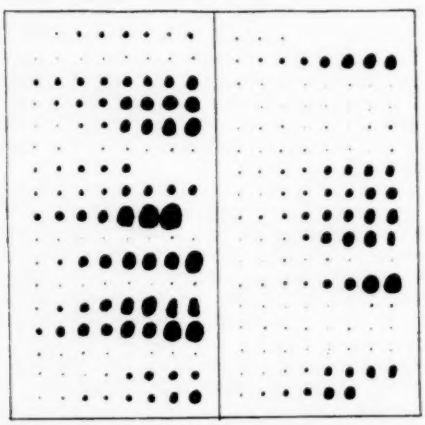
This conception of our treatment, being a stimulus to the defensive action of the junction tissue in addition to any possible stimulation of general defence mechanisms, is of importance with regard to combination of such chemotherapeutic agents and radiotherapy. We find that radium treatment of implanted mouse cancer, the Twort adenocarcinoma, appears to cause an increase of this junction tissue, and we are inclined

† This estimate is made from the whole of this series; if it had comprised mainly carcinoma of lip and tongue, or other resistant types, more than one-fifth would be found non-responsive.

to think that the regressing action of gamma rays in vivo is due to stimulation of this junction tissue, rather than to direct noxious action on the cancer cell. The plates show that where junction tissue is plentiful and well formed the proximal cancer cells are necrosed, wholly or in part. Where junction tissue is scanty or absent the cancer shows no necrosis, even though the dosage of radium was kept constant (Figs. 3 and 4). Since, then, radiation and some lead compounds both increase this mesoblastic defence tissue, a union of the two ought to be more potent than either singly. Though proof of this opinion is not complete, we have evidence supporting it in man and in animals, and I have verbal accounts of some encouraging results from other centres.

Our early efforts to combine radiation with lead selenide were unfortunate. A record has been published,[3] and full details are not necessary here. In brief, we found that the application of half carcinoma doses of radium, radon, or X rays shortly after treatment with lead selenide was followed by a prompt increase of the rate of growth of the neoplasm; this was one reason for considering the possibility that radiation does not act primarily on the cancer cell, for if it did there should not have been increased growth. We know that there is a stimulating dose for cancer, but this is regarded as considerably less than half the accepted dose. When 12 cases had been radiated after injection of lead selenide, and the stimulation was observed in each case, we stopped this in man and continued the research on animals. We found that the result was the same in implanted cancer; radium applied in usual dosage soon after selenide injection resulted in larger growths and more rapid death than was found in the untreated control animals. We have reason to believe that it is the selenium which is responsible

FIG. 5.

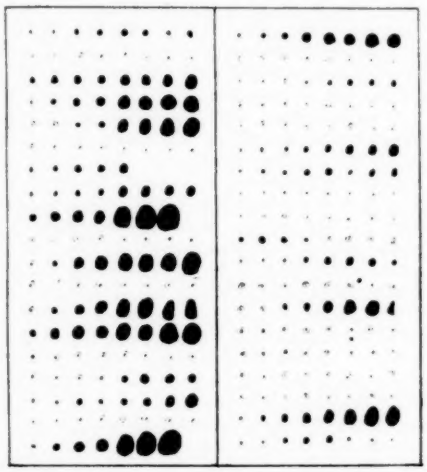


Twort adenocarcinoma treated by oral administration of pure vitamin A. Controls left; treated animals right. Each horizontal line is composed of the silhouette of the cancer at weekly intervals. The size is reduced about ten times.

for this, for a colloidal lead guaiacolate could be administered before irradiation without this adverse result. Fig. 3 showing well-formed junction tissue and necrosed cancer is from a mouse treated with lead guaiacolate and then radiated. Fig. 4 showing the reverse is from a mouse receiving lead selenide and then radium; both sets were given exactly the same amount of lead metal and radium. The explanation appears to be as follows:

The members of the selenium group of metalloids are peculiar inasmuch as they are ionised by deep X and by gamma rays. We have proof for sulphur, which is so nearly related to selenium that laws for the one will hold for the other, that diminution of the size of the particle is followed by increase of toxicity; this would follow, the smaller the particles the larger would be the surface available for chemical action. We picture the selenide taken up by the macrophages and possibly the fibroblasts around the cancer in the junction tissue; here the colloid is sometimes visible as relatively large clumps in the cytoplasm. When

FIG. 6.



Twort adenocarcinoma treated by oral administration of pure vitamin D. Controls left, treated animals right, as in Fig. 5.

gamma rays reach it some or all of this mass is ionised, its toxicity is increased, and the cell containing it is destroyed. When a non-ionisable colloid, such as the guaiacolate, is used this cell destruction does not follow.

We, and others, are attempting to work out a technique for radiation therapy concurrently with selenide. It is too soon to give results yet, but in this laboratory, and at least one other, there have been results which give promise of this combination being useful. Such a combination would require less radiation and less selenide. For the present we are careful not to subject to radiation any patient who has been recently treated with selenide. We ask for any radiation to be given first, in the hope that this will increase the junction tissue and its function, and that the selenide will cause a further increase.

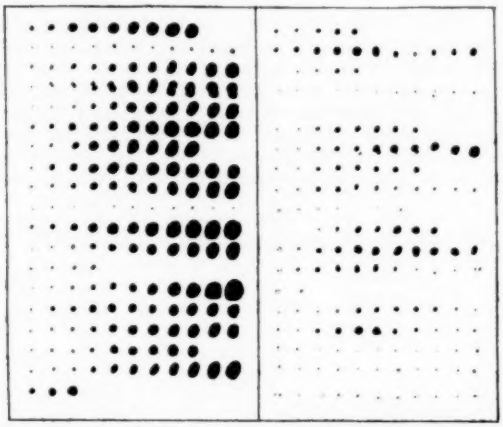
Additional Treatment.

The remaining part of the treatment we use need not detain us so long, but its importance is not the less for this. In view of the known fact that lead tends to be stored in the bones as a compound lead-calcium phosphate, we considered that the patients ought also to be treated with any substance likely to diminish this storage; otherwise any condition associated with acidosis would occasion a liberation of unknown amounts of ionic lead from the skeleton and cause lead poisoning. The obvious remedy was calcium chloride, for this would not only cause enough acid shift in the plasma to prevent much bony deposit of lead, but it would also give the organism a sufficient depôt of calcium for any depletion of the skeleton.

In addition, we know that cancer tissue and the plasma of cancer patients show a poverty of calcium. The poverty of calcium is proportional to the rapidity of growth of the cancer; the more virulent and advanced the growth the less is the calcium content of cancer and plasma; periosteal sarcoma appears to be an exception. Moreover, most researches on the acid-base equilibrium of cancer patients and animals show that in precancerous states and in cancer, before cachexia has developed, the patient is alkalotic [4];

alkalosis is accompanied ... diminution of ionised, or active, calcium. Calcium c... ride, though a neutral salt, causes acidosis by relinqu... ing hydrochloric acid in the alkaline intestine, the calcium becoming carbonated from waste gases. Calcium chloride would appear to be indicated as it would correct the alkalotic shift and thereby increase the diminished calcium, while at the same time it would leave a depôt of calcium for absorption. Our patients all receive 3 g. of calcium chloride daily; this is given as an albuminate, and the formula is published.[8]

FIG. 7.



Twort adenocarcinoma treated by weekly intravenous injection of lead selenide. Controls left. Note slow rate of growth of controls and much slower growth of the treated animals.

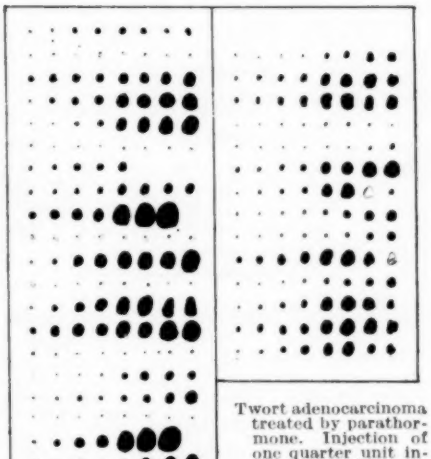
In the hope of increasing the assimilation of calcium, we started giving our patients the fat-soluble vitamins about a year ago. The fat-soluble vitamins, in addition to having this remineralising action, are said, at the present time, to have an anti-infective action. It would take too long to consider the problem of cancer as an infective disease, and though many would not subscribe to this belief at present, few will deny that the advanced cases we treat are secondarily infected. The fat-soluble vitamins should be of help in combating this septic factor. The evidence in the literature is very conflicting as to the value of vitamin medication in cancer; the reason may be the different concentrations and mixtures employed by various workers. We have done a good deal of experimentation with vitamin feeding of mice with implanted cancer and we can say, with some assurance, that Ostelin, pure vitamin A and pure D all diminish the growth of Twort carcinoma. Pure vitamin D, especially, is markedly inhibitory, the retardation and regression of the implant which follows its ingestion is quite as marked as that of treatment with lead selenide (Figs. 5, 6 and 7).‡ Owing to the generosity of the British Drug Houses we have been able to treat our human cases with very large doses of vitamin D of late; it appears to be really useful when the amount of oily solvent can be tolerated. One instructive case is worth a brief description here:

About a year ago I was asked to see a patient who had developed acute pain in the right chest. A radiogram showed a large solid mass. A little later two nodules appeared in the subcutaneous tissues of the left chest wall. A few days afterwards his right eye became paralysed. On examination I found a complete ophthalmoplegia of the eye, a solid right base, two large masses in the left chest wall and spastic diplegia of the legs. I concluded that this was probably sarcomatosis, and advised excision of one of the superficial masses; this was found to be a polymorph-celled sarcoma, and this diagnosis has been confirmed by several authorities. In view of the rapidity of the symptoms in this case and the scarcity of beds, I advised the patient's doctor that it would be well to wait and watch the rate of growth; if the latter was not so rapid as we thought we would attempt treatment. The patient was advised to rest and to eat as much spinach as possible, and as he had an unlimited supply he ate a great deal. The remaining superficial mass rapidly disappeared, the right base became resonant again and X rays showed no opacity, his diplegia passed off. A few weeks later he came to see me. Then he was able to do what he wanted, which was to go to as many race meetings as possible; provided he covered his lame eye, he felt very well. This man had no treatment but spinach, a vegetable especially rich in vitamin A and in carotene. His recovery may have been coincidence, but in view of our animal results I am inclined to attribute it to vitamin A. It should be pointed out that after about six months he had a relapse and died.

Besides the fat-soluble vitamins, parathyroid extract increases the calcium of the plasma and tissues. We have observed the effect of this in animals; given by the mouth it appears to have no action. Collip's parathormone, given by injection, however, appears to have a definite retarding action in mice implanted with Twort carcinoma (Fig. 8).

Thyroid extract, a true tonic by virtue of its action in stimulating metabolism and immunity processes, has a place in the treatment of cancer. We usually give a small daily dose. Finally, to combat the anæmia usually present in advanced cancer and the anæmia occasioned by prolonged injection of lead compounds, we give the patients liver extract. Again we have experimental evidence that animals with implanted cancer do better if given liver extract. We give a daily dose corresponding to four ounces of liver.

FIG. 8.



Twort adenocarcinoma treated by parathormone. Injection of one quarter unit intraperitoneally twice weekly.

Conclusions.

This is, in outline, the treatment we give our patients, and the reasons for giving it. We do not advise anyone to adhere to our programme; we must, for we are in hopes of finding a better treatment. But the method, as we practise it on advanced cases, will probably not reduce the mortality of cancer appreciably. We hope that the surgeon will reduce

‡ The implanted cancer noted here in the animal experiments is Twort adenocarcinoma from the Imperial Cancer Research Fund. We use solely a very slowly growing strain, for the more rapid strains do not allow sufficient time to observe the effects of this treatment. This slow strain is maintained by implanting from small, slowly growing tumours. Selenide treatment of rapidly growing implanted cancer has given relatively poor results in this laboratory, nothing like the results figured here. The rate of growth can be inferred from the figures; charting commences about four weeks after implantation and thence at weekly intervals.

this mortality by applying this method in association with the present surgical procedures:

1. Until we, or others, have found a method for the concurrent treatment by radiation and selenide, to treat such cancers as are likely to be influenced with radiation first, and as thoroughly as possible. After radiation is over and the patient has had time to recover, to treat by this method.

2. In inoperable cancer to remove as much as possible by surgical means and afterwards to try to make the remainder regress with selenide. It seems logical to expect a better, and easier, result when most of the mass has been removed. In cases of cancer with metastases in liver or kidney it will be well to remove the primary growth, for the metastases in liver and kidney appear to require small doses of colloid and do badly on the larger doses required by their primary growths.

3. Especially we advise giving the treatment after operations which are regarded as having been complete. In an unknown percentage of the cases completion has not been achieved and recurrence follows. Since reaction, and adverse effects of the treatment largely depend upon the amount of destruction of the cancer, these cases should and do react little, and the treatment is little hardship.

Finally, we strongly advise that the whole of the method is used; we cannot be sure how much the interaction of the various medicaments conduces to the results we get. That is, we advise that the patient be given: (1) lead selenide to increase local and general defence mechanisms; (2) calcium chloride to increase ionised calcium by acidosis, to correct alkalosis, and to furnish a depot for calcium assimilation; (3) fat-soluble vitamins in large doses, especially vitamin D as Radiostoleum or pure D, to increase calcium absorption and to combat any infective element; (4) small doses of thyroid extract as a tonic and anti-infective agent; (5) liver extract to combat anæmia.

REFERENCES.

1. Thomas, J.: Néoplasmes, 1928, vii., 229.
2. Todd, A. T. et al.: Chemotherapeutic Researches on Cancer, London, 1928.
3. Todd, A. T., and Aldwinckle, H. M.: Brit. Med. Jour., 1929, ii., 799.
4. Reding, R.: Néoplasmes, 1928, vii., 175; Weiss, S., Sümegi, S., Udvardy, L. von: Klin. Woch., 1928, vii., 1178; Schreuz, H.: Klin. Woch., 1929, viii., 1764; Flaszen, J., and Wachtel, H.: Ibid., 1929, viii., 1912; Reding, R., quoted by Fischer Wasels, B.: Ibid., 1930, ix., 1153.
5. Loc. cit. (2), p. 67.

RHEUMATISM IN CHILDHOOD.

By Wilfrid Sheldon, M.D., M.R.C.P. Lond.,

JUNIOR PHYSICIAN TO THE CHILDREN'S DEPARTMENT, KING'S COLLEGE HOSPITAL; OUT-PATIENT MEDICAL REGISTRAR, THE HOSPITAL FOR SICK CHILDREN, GREAT ORMOND-STREET.

This paper is based on the notes of 600 consecutive cases of rheumatism seen during the last two years at the rheumatic clinic of the Hospital for Sick Children, Great Ormond-street. Many were under observation during the whole of this period.

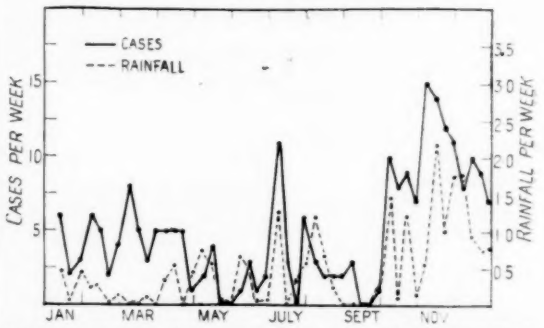
The children can conveniently be divided into four groups: (1) those with rheumatic pains in the limbs (235); (2) those with a history of rheumatic fever or acute articular rheumatism (133); (3) those with chorea (197); (4) those with rheumatic heart disease (266).

Rheumatic Pains.

Children who complain of recurring pains in the limbs form an important group in a rheumatic clinic because of the possibility that some of them may later on develop heart disease. The joint pains that occur with rheumatic fever are not included in this group.

Rheumatic pains are seldom met with before the age of 3 years. Although most common in the legs, they also occur in the arms, over the shoulders, and round the neck. Usually they can be localised by the child to some definite area of the limb, often in the neighbourhood of joints although not actually in the joints; at all events, movement of the joints does not give rise to pain, nor is there any limitation of joint movement. The pains are persistent, and often make the child restless. In some cases the pains are localised over the origin and insertion of muscles, the insertion of the deltoid and coraco-brachialis being a frequent site. Pains in the chest are also common, and are possibly connected with the intercostal muscles and ligaments. In some children

FIG. 1.



Showing incidence of rheumatic pains and rainfall during 1929.

the pains seem to be particularly frequent at night soon after the child has got into bed; such night pains can often be eliminated by putting the child to sleep between blankets. Pains that occur during the day are as frequent in the morning as in the evening, and are not related to fatigue.

There seems little doubt that the incidence of rheumatic pains bears some relation to cold and wet weather. In Fig. 1 the continuous line represents the number of children per week who complained of pains in the limbs while attending the rheumatic clinic at Great Ormond-street during 1929. The broken line represents the weekly measurements of rainfall in inches recorded at Camden-square, N.W., during the same period. For these latter figures I am indebted to the British Rainfall Association. There is sufficient parallelism between the two lines to justify further investigation into this aspect of rheumatism. A discrepancy between the lines is obvious in March when, although rain fell on one day only, the incidence of rheumatic pains remained practically constant. Following upon a fairly dry May and June, the first week of July was very wet, and complaints of limb pains were then numerous. September was a month of drought, and there were practically no complaints of pains. The drought terminated in the first week of October, and with the fall of rain complaints of pains were resumed.

The pathological process concerned in the production of rheumatic pains is uncertain, and the evidence for regarding them as rheumatic rests on their clinical association with other manifestations of rheumatism. In 52 out of 266 children with rheumatic heart disease, pains in the limbs over several months was the only evidence of rheumatism that preceded the discovery

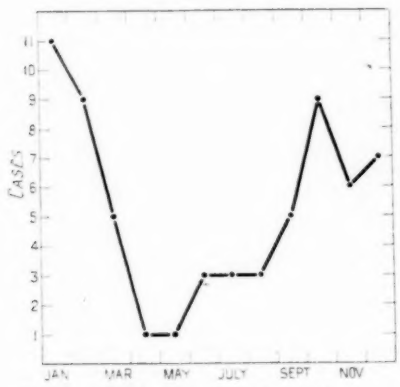
of the heart lesion. A history of pains in the limbs preceded 15 out of 197 cases of chorea. The common impression that these pains afford early evidence of rheumatic infection is borne out by these figures. It is unusual for the reverse to happen—namely, that pains in the limbs should be a late symptom of rheumatism, appearing for the first time several months or years after a child has shown other signs of rheumatic infection.

In the treatment of children suffering from rheumatic pains general hygienic measures are of the first importance. It is significant that rheumatic children practically never complain of pains while they are away at a convalescent home. Damp, draughty houses predispose to these pains, new houses being often as bad in these respects as old ones. Thick boots and long stockings should be worn, and in wet weather provision should be made for the child to be able to change into dry shoes at school. Sleeping between blankets should be advised. Sodium salicylate, which is of great service in acute articular rheumatism, is often disappointing in dealing with these pains. It has been used in doses of grs. 5 and 10 once or twice a day, with inconstant results, and sometimes the drug has seemed to depress the children and interfere with the appetite. The external application of liniment of methyl salicylate has been found more helpful; rubbing with the liniment for a few minutes will generally dispel the pains which, however, are likely to return so long as the general health remains unimproved. For this purpose a period of convalescence and the judicious use of a suitable tonic, such as equal parts of the syrup of the iodide of iron and malt, are often of value.

Rheumatic Fever.

In common with the other rheumatic manifestations, rheumatic fever, or acute articular rheumatism, is rarely encountered before the age of 3 years. Out of 133 instances of acute articular rheumatism, the youngest example occurred in a child 2½ years old, and three cases developed at the age of 3 years. Rheumatic fever is particularly likely to occur during the cold and wet months, being in this respect similar to rheumatic pains in the limbs. Fig. 2, compiled from 63 cases of rheumatic fever, gives the number of cases occurring in each month of the year, and shows how the incidence of the condition falls off during the summer months.

FIG. 2.



Showing the incidence of rheumatic fever (63 cases in all) throughout the year.

A feature of rheumatic infection, no matter what clinical form it takes, is the inability of the patient to establish a lasting immunity after one attack. Of the 133 cases now under discussion, 21 experienced a second attack and two had three attacks. The shortest interval between any two attacks was six months.

The symptoms of rheumatic fever are often milder in childhood than in adults, and the classical description of painful swollen red joints, one joint being affected after another, is not always seen. The affected joint is invariably painful, but swelling is not always evident, while a red flush over the joint is less common than swelling. Occasionally only one joint is affected.

The relation between rheumatic fever and heart disease is too well recognised to need discussion. Coombs [1] has recently stated that every child with rheumatic polyarthritis may be assumed to have an infected heart also, although clinical evidence of the heart affection may not always be found. Of the 133 cases of rheumatic fever at the clinic at the Hospital for Sick Children, 93 (70 per cent.) showed evidence afterwards of cardiac involvement. Of the remainder, rheumatic fever was followed by chorea in five cases, and by pains in the limbs in 12 cases. Only 23 children (17 per cent.) have been entirely free of rheumatic symptoms since their attack of rheumatic fever. These figures illustrate the necessity of keeping under observation for some time children who have once had rheumatic fever. The supervision of these children should be one of the functions of a rheumatic clinic.

Chorea.

The age incidence of chorea begins a little later than the other manifestations of rheumatism, being uncommon before the age of 5 years, when schooling begins. Poynton [2] has recorded an example of rheumatic chorea in a baby of 10 months. Sydenham's chorea is so often associated with other forms of rheumatism that it is now generally accepted as a rheumatic manifestation. Of 197 cases of chorea at the rheumatic clinic at Great Ormond-street rheumatic heart disease occurred in 52, rheumatic fever preceded five cases, and in 15 instances rheumatic pains in the limbs either accompanied or followed the chorea. Thus 36 per cent. of the children with chorea had also other forms of rheumatism. On the other hand, there appear to be other factors at work in the production of chorea besides rheumatic infection. The condition is more common in girls than boys—of the 197 children with chorea, there were 2·1 girls affected for every boy—whereas rheumatic fever and rheumatic carditis are evenly distributed between the sexes. The onset of chorea often dates from some psychical shock. In one child the fright of a thunderstorm was sufficient to start the chorea; a caning at school preceded another; minor street accidents seem to be becoming an increasingly common forerunner. The mental stress of education undoubtedly plays a part, particularly competitive education such as is entailed in working for a scholarship. Children who are apt to develop chorea are almost always quick and intelligent and keen on their school work, but for the sake of their health it is a pity that they cannot work in a class where marks do not exist and where there is neither a top nor a bottom place. I have endeavoured to obtain figures showing the effect of schooling upon the production of first and later attacks of chorea, but this has proved impracticable. In this connexion the school medical service should be able to gather valuable information.

TABLE I.

Children attending clinic after—			
1st attack of chorea	142	4th attack of chorea	3
2nd " " "	40	5th " " "	1
3rd " " "	9	6th " " "	2

Chorea is very likely to relapse. From Table I. it may be seen that one or more relapses occurred in 28 per cent. of 197 children.

TREATMENT.

There is little doubt that, in the treatment of acute chorea, rest in bed is the most important factor. Difficulty arises when the choreic child has recovered sufficiently to return home. When should the child go back to school? Here no general rule can be laid down. At the clinic at the Hospital for Sick Children the average time that children with chorea have been exempt from school has been six months. This has seemed unnecessarily long in some cases, while others have relapsed on returning to school after an absence of 12 months. The home circumstances must influence the decision. If absence from school implies that the child will spend most of the day in the street dodging traffic it is better for that child to return to school early. When there is a garden and the mother or some other responsible person is at home all day, six months away from school should be a minimum. A stay at a convalescent home is valuable, particularly if a mild amount of education can be combined with the convalescence. In many cases half-day attendance at school for two or three months before allowing whole-day attendance has proved useful. Once a choreic child returns to school he soon makes up the ground lost through absence. Close coöperation with the school medical service and the education authorities is essential in the management of these children.

Rheumatic Heart Disease.

Of the 600 children with rheumatism whose notes have been analysed, 266 were found to have heart disease—a percentage of 44. Table II. summarises the evidence of rheumatic infection being present before the onset of heart disease.

TABLE II.

	Cases.
Acute articular rheumatism preceded carditis in ..	87
Chorea preceded carditis in	52
Recurrent pains in the limbs preceded carditis in	52
Tonsillitis—no other symptoms—preceded carditis in	7
Carditis dating from scarlet fever	10
Carditis dating from diphtheria	4
Carditis dating from tonsillectomy	2
Insidious—no preceding rheumatic history	36

The group in this Table to which I wish to allude is the last—the 36 cases of insidious heart disease. In these a careful inquiry into the child's history failed to reveal any item suggestive of rheumatism. Unfortunately, the rheumatic process seems to be none the less destructive for being insidious in onset. Of the 36 children only one has recovered. This was a boy who was found to have a dilated heart with an apical systolic bruit; 18 months later the heart became normal. Four children of this group first attended with systolic and mid-diastolic apical murmurs; the mid-diastolic element has now gone, although the systolic murmur persists. Of the remainder, 24 have a well-marked mitral systolic murmur and four of these are certainly proceeding to stenosis. One boy has aortic regurgitation, while of six children who have attended with mitral stenosis of insidious origin two have died. Rheumatic heart disease coming on insidiously tends to run a slowly progressive course, which it is difficult to influence by therapeutic measures.

The early diagnosis of rheumatic heart disease may sometimes offer considerable difficulty when a child has a soft systolic bruit at the apex, but the heart is not enlarged. In many of these the bruit is temporary and disappears when the general health improves. A history of acute rheumatism or chorea suggests that the bruit is organic. Organic systolic murmurs are often more easily heard when the child is lying down or lying on his left side than when he is standing up. They also show little variation with inspiration and expiration. Such cases as these, in which the diagnosis of rheumatic disease of the heart is in doubt, may with advantage be supervised in a rheumatic clinic for a few months, until the significance of the bruit has been determined.

The presence of a murmur at the apex during diastole is a valuable sign of organic disease. The most common murmur to be heard during this period is a mid-diastolic murmur, and this often enables one to be sure that a systolic bruit is organic. In order to hear a mid-diastolic murmur it is generally necessary to have the child lying down. The murmur is separated from the second sound by a short interval, giving rise to three sounds at the apex—a systolic murmur, then the second sound, followed by the mid-diastolic murmur. Its point of maximum intensity is a little internal to the apex-beat, and it is very localised, seldom covering an area more than an inch or an inch and a half in diameter. The following case throws some light on the way in which this murmur is produced:—

A girl, aged 5, was sent to the rheumatic clinic on account of heart disease. She was found to have complete heart block, the ventricular rate being 44 per minute, while the auricle was beating at 80 per minute. In addition to a systolic murmur at the base of the heart, there were systolic and mid-diastolic murmurs at the apex. The mid-diastolic murmur occurred 44 times each minute, which indicated that it was produced by the action of the ventricle rather than by that of the auricle.

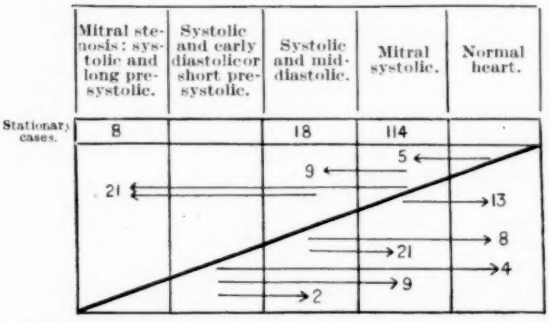
It seems likely that the murmur is due to the ventricle sucking blood from the auricle during diastole through a thickened or stiffening mitral valve. Sutherland[3] has expressed the view that the diastolic murmurs at the apex in rheumatic heart disease originate from the aortic valve, but there is little to support this. Other evidence of aortic disease, such as Corrigan's pulse and a big pulse pressure, is wanting; moreover, the typical aortic regurgitant murmur heard in adults down the left border of the sternum can also be heard in children who at autopsy are found to have aortic disease.

Observation of rheumatic hearts over long periods shows that the mitral murmurs generally appear in a definite order. This sequence has been described by Still.[4] A systolic bruit at the apex is the first to appear; this is followed by reduplication of the second sound; the second portion of the reduplicated sound then slurs off into a mid-diastolic murmur. This murmur, the characters of which have already been described, is the most common murmur to be heard in diastole during childhood. When the disease progresses further the mid-diastolic murmur may be replaced by an early diastolic murmur. This bruit is often interchangeable with a short presystolic bruit, the latter being heard when the heart-rate is rapid, the early diastolic reappearing as the heart-rate slows. The short presystolic murmur is temporary, unaccompanied by a thrill, and distinct from the classical crescendo presystolic murmur of established mitral stenosis.

When the acute infection of the heart subsides the murmurs just described will often be found to retrace their steps. After a few months the early diastolic and short presystolic murmurs settle down into a mid-diastolic bruit, which may persist for several months or years. In some cases the mid-diastolic bruit reverts to a reduplicated second sound, which gradually returns to a normal second sound. In a few cases the systolic murmur also disappears and, as far as one can tell, the heart is then normal. On

the other hand, mitral stenosis may slowly develop from the stage of systolic and diastolic bruits; the first sound at the apex then gradually becomes sharper and louder, while the mid-diastolic murmur links up with the first sound until finally the long rumbling presystolic murmur characteristic of mitral stenosis is fully developed. Mitral stenosis does not develop for several years after the original attack of endocarditis. Of the cases analysed, three years was the shortest period in which mitral stenosis developed, but often double that time is required. Fig. 3 shows how the mitral murmurs in 232 children have

FIG. 3.



Illustrating the progress of mitral murmurs towards stenosis (above oblique line) and towards recovery (below line) in 232 children.

changed during a period of from one to two years' observation. The murmurs have remained unchanged in 140, 21 are proceeding to mitral stenosis, while 42 have lost their diastolic murmurs, and in 25 the heart has become normal.

Aortic regurgitation was present in 6 per cent. of 266 children with rheumatic heart disease, a figure which agrees closely with that of other observers. Rheumatic nodules in the subcutaneous tissues, most commonly over the elbows, knuckles, knees, ankles, and occiput, almost invariably indicate the presence of active rheumatic carditis.

The recuperative power of children against disease is a continual source of encouragement to those who work among them, and the very fact that children with early rheumatic disease of the heart are in some cases capable of completely overcoming their heart affection stimulates every effort to help them in their struggle towards recovery.

Tonsillectomy in Rheumatism.

The question of the value of tonsillectomy in rheumatism is a vexed one, and much has recently been written on the subject. Of 600 consecutive cases of rheumatism at the rheumatic clinic at Great Ormond-street tonsillectomy has been performed on no less than 540 (90 per cent.). Of these, 393 were operated upon before their admission to the clinic. Table III. shows the relation between operation for removal of tonsils and the onset of rheumatic pains (174 cases), chorea (143 cases), and rheumatic fever (111 cases). Cases in which visible tonsil remnants remained after the operation have not been included in this Table.

TABLE III.

Rheumatic pains occurred—		
Before and not after tonsillectomy in	52	cases.
Before and after "	53	"
After and not before "	69	"
Chorea occurred—		
Before and not after tonsillectomy in	73	"
Before and after "	20	"
After and not before "	50	"
Rheumatic fever occurred—		
Before and not after tonsillectomy in	71	"
Before and after "	4	"
After and not before "	36	"

These figures show that approximately one-third of the cases of rheumatic pains, chorea, and rheumatic fever commence these symptoms of rheumatic infection after the tonsils have been removed. In addition, the pains continued after the operation in half of 105 children who had rheumatic pains in the limbs before the removal of their tonsils; and of 93 children who had chorea before removal of their tonsils the chorea relapsed after the operation in 27 per cent.

Unless it can be shown that tonsillectomy has a definite influence in the prevention of cardiac disease, there seems small justification for the operation merely on the ground that the child is a rheumatic subject. Miller[5] has suggested that tonsillectomy is a useful prophylactic measure against rheumatic heart disease, but convincing proof either for or against this view is most difficult to establish. Analysis of 266 children with rheumatic heart disease showed that in 46 cases (17 per cent.) the tonsils had been removed before signs of cardiac disease were discovered. It seems more probable that the value of tonsillectomy in rheumatic children is in proportion to the degree of impairment of the general health attributable to the tonsils. In other words, the tonsils of rheumatic children should not be removed unless there is evidence that they are affecting the general health adversely. Such evidence as a history of repeated sore-throats, chronic enlargement of the tonsillar glands in the neck, and the appearance of the tonsils must all be taken into consideration. The size of the tonsils alone is an unreliable guide, small scarred tonsils being often as injurious to the child's health as hypertrophied tonsils.

I wish to express my sincere thanks to the medical staff of the Hospital for Sick Children, Great Ormond-street, for their permission to make use of figures gathered from the rheumatic clinic.

REFERENCES.

1. Coombs, F. Carey: Brit. Med. Jour., 1930, i., 228.
2. Poynton, F. J., and Paine, A.: Researches on Rheumatism, London, 1913, p. 290.
3. Sutherland, G. A.: Diseases of Children (edited by Garrod, Batten, Thursfield, and Paterson), 2nd ed., London, 1929, p. 418.
4. Still, G. F.: Common Disorders and Diseases of Childhood, 4th ed., London, 1924, p. 535.
5. Miller, R.: Brit. Med. Jour., 1926, ii., Supplement p. 19.

WILLESDEN CANCER CLINICS.—The report of the first six months' work of the Cancer Clinics, opened by the Willesden Urban District Council, shows that 52 patients attended, most of whom had been attracted by advertisements, posters, and leaflets. In 18 cases the advertisements of various kinds had awakened fear that some condition which had been looked upon as trivial might be cancer, and one patient actually was found to be suffering from cancer in an early stage. Of the others, 17 had "conditions requiring operation or treatment;" 11 had "conditions known to be forerunners of cancer," while six were suffering from conditions the relationships of which to cancer have not yet been established. In 20 cases it was possible to make a definite statement that the patient was not suffering from cancer. The report adds that the clinics have been the means of securing treatment for 12 patients suffering from cancerous or pre-cancerous conditions at a stage of the disease when there is every reason to believe that a cure will be effected or the danger removed.

CLINICAL AND LABORATORY NOTES

PROTEIN MILK IN INFANT FEEDING.

By NORMAN HILL, M.D., M.R.C.P. LOND.,
PHYSICIAN TO THE METROPOLITAN HOSPITAL AND TO THE BELGRAVE HOSPITAL FOR CHILDREN;
AND
A. W. C. MELLOR, M.B. CAMB.,
LATE HOUSE PHYSICIAN, BELGRAVE HOSPITAL FOR CHILDREN.

PROTEIN milk, or the *Eiweiss-Milch* of Finkelstein, has long been in use both on the Continent and in America as a milk modification suitable for the feeding and treatment of infants suffering from the various forms of diarrhœa and malnutrition. Its value in these conditions does not appear to have been fully appreciated in this country, and although recently the English literature has contained several accounts of feeding with acidified and lactic acid milk, little or nothing has been written concerning protein milk, whilst even the latest text-books contain scant information regarding its application.

Protein milk is prepared, roughly, by rubbing through a fine sieve the dried curd obtained by coagulating a quart of milk with rennet, gradually adding to this curd a pint of buttermilk and making up to the quart with boiled water. Dried varieties are now on the market. The composition of this mixture differs somewhat according to the amount of fat in the milk employed; Holt [1] gives the average as: protein 3·75 per cent., fat 3–3·5 per cent., sugar 1·8 per cent., salts 0·65 per cent.; whilst Langstein and Meyer [2] give: protein 2·8–3 per cent., fat 2–2·5 per cent., sugar 1·2–1·6 per cent., and salts 0·45–0·5 per cent. The calorie value is from 12–14 per ounce.

The advantages of this milk are: (1) the high protein content tends to make the stools less frequent and also alkaline; (2) the small amount of sugar minimises the risk of fermentation; (3) the moderate fat forms soaps which favour the production of formed stools; and (4) the presence of lactic acid makes the curd more easily digested.

As the preparation of fresh protein milk takes a great deal of time and trouble, and as it appears to have no advantage over the dried variety, we have used the latter in all cases, the percentage composition approximating to the higher values in Langstein and Meyer's table. This mixture has a calorie value of about 12 calories to the ounce, and we have used the standard strength in all cases of whatever age. As one of us (N. H.) has now been using this milk for some four years, it seemed to us that a useful purpose might be served in briefly summarising the results.

A SERIES OF CASES FED ON PROTEIN MILK.

Rather less than a hundred cases altogether have been fed on protein milk, a number which we realise is small. In the early trials only the most severe and often apparently hopeless cases of ileocolitis were given it, so that any attempt to prove its efficacy or otherwise by mortality-rates would be fallacious. Latterly we have given this milk early in the disease and kept the infants on it for longer periods, a procedure which we found fully justified by results. In cases of severe ileocolitis our routine is now as follows.

If the infant is not too collapsed and dehydrated, an initial dose of castor oil is given, and the child is fed for the first 12–24 hours on boiled water sweetened with saccharine or 5 per cent. lactose. After this, protein milk is started, at first with no added sugar but sweetened with saccharine gr. 1 to the quart. The sweetening is important, as not a few infants refuse to take protein milk unsweetened, as it has a peculiar, rather sour and unpleasant taste. As soon as the stools have started to improve, which occurs as a rule in one to four days, dextrimaltose is added, at first in very small quantities (half a drachm per feed) and then gradually increasing until eventually 6–10 per cent. has been added. We have been guided in the rate of addition by the state of the stools, it being possible in some cases to add much more rapidly than in others. For the first few days the infant may lose weight, or the weight remain stationary, but often after the first few days the weight increases even before the dextrimaltose has been added. The stools as a rule become alkaline in reaction after three or four days, gradually changing back again to acid as more dextrimaltose is added.

The infants are kept on protein milk for periods ranging from three to six weeks—but never longer—depending on the severity of the case, and then ordinary milk modifications are substituted, starting with two feeds and so returning to feeds suitable in strength and amount to the infant's age.

In cases of malnutrition, with or without undigested stools, we have placed the infant straight away on protein milk with added dextrimaltose, 4–6 per cent., and these cases can usually resume a diet normal for their age after two or three weeks, again depending on the severity of the case.

Two cases of the series in which this milk was used were cases of hypertrophic stenosis of the pylorus with the loose and frequent stools which occasionally follow operation. In both cases the condition rapidly improved and the infants recovered. The youngest case in our series was aged 3 weeks, an infant which was sent to hospital on account of vomiting and loss of weight and suspected duodenal stenosis. This infant took the protein milk well, gained weight, and left the hospital thriving on a simple milk modification.

We have made no fixed rule for the quantity and frequency of feeding, and treat each infant individually, giving as a rule sufficient protein milk to satisfy. Infants fed on this milk sometimes become constipated, but this can usually be overcome by the addition of more dextrimaltose to the feed.

A definite advantage when feeding with protein milk, in cases either of ileocolitis or malnutrition, is that a return to an ordinary feed suited to the infant's age may be made more quickly than when using ordinary milk or dried milk modifications. We have found this fairly consistently and, in addition to benefiting the infant, it enables the institution to employ its accommodation to the best advantage. An occasional difficulty arises in cases of ileocolitis when the protein milk without added dextrimaltose has led to an improvement in the stools, but the stools have relapsed as soon as any dextrimaltose was added and the infant's general condition has become worse, whilst without the added dextrimaltose the feeds were not of sufficiently high calorie value for the infant even to maintain its weight. Some of these infants were tried on other foods without success, whilst in others we attempted to add dextrimaltose, also without success.

COMMENTS.

We consider that protein milk is of very definite help in certain difficult cases of infant feeding, and in many cases in our series it appeared to be the only mixture which the infant would tolerate. Griffith and Mitchell,[3] in discussing protein milk,

[1] Holt: Diseases of Infancy and Childhood. New York. 1926, p. 129.
[2] Abt's Pediatrics. Philadelphia. 1923, vol. ii., p. 749.
[3] Griffith and Mitchell: Diseases of Infants and Children. Philadelphia, 1927, vol. i., p. 158.

state that "although the truth of the original theories which led to the production of casein milk seems repeatedly to have been disproved, the fact remains that the preparation is one of very great value, particularly in many diarrhœal disturbances in infancy." With this we are in complete agreement.

The main points to remember when using protein milk are: (1) that it is a "medicinal food" and that infants should not be kept on it for more than six weeks; (2) that saccharine should be used for sweetening purposes at the onset in cases of ileocolitis; (3) that no gain in weight can be expected until sugar in the form of dextrimaltose is added, and this addition should never be delayed for more than a few days; (4) that although protein milk is a most useful adjunct to infant feeding, it must not be considered as a panacea for every nutritional disturbance occurring in infancy.

CATHETER-EXTRACTION OF A URETERAL STONE PER URETHRAM.

By E. H. R. Altounyan, *M.C.*, M.D. Camb.,
assistant surgeon to the altounyan hospital, aleppo, syria.

Urologists are always urging surgeons to attempt non-cutting methods in the removal of stone from the urinary tract. That manipulation may occasionally be successful is illustrated by the following case.

An Arab male, aged 40, was admitted on Nov. 5th, 1928, with a vesical fistula following a suprapubic cystotomy for stone, performed elsewhere. His general condition was poor, and all urine came through the suprapubic cystotomy, in the scar of which a keloid had developed. On the following day the scar was excised and the bladder drained. On Dec. 4th a stone impacted in the urethra was removed by external urethrotomy. On Jan. 10th, 1929, he underwent a second operation to close the suprapubic fistula, and yet a third on Feb. 5th. The last was successful. On March 4th the urine was still dirty, and a complete X ray examination was repeated, and revealed: (1) a stone in the right ureter, (2) a stone in the pelvis of the left kidney.

Stone removed per urethram. It measured 1·8 × 0·8 cm.

In view of the poor general condition of the patient it was decided to attempt to dislodge the ureteral calculus by catheterisation. Two ureteral catheters were passed well up the right ureter, and X rays showed them lying one on each side of the stone. On removing the catheters with considerable effort, something, presumably the stone, was felt to give, though at the moment it seemed probable that the catheters had broken off in the ureter. Next day the procedure was repeated; only after passing the catheters well up towards the kidney it was decided slowly to twist them round and round before pulling them down.

This manœuvre apparently freed the stone from the ureteral wall and at the same time secured a firm grip for the catheters, for on slowly withdrawing them, while keeping up a twisting movement, the calculus was safely delivered at the meatus. The most I had hoped for was a dislodgment into the bladder, but apparently the mouth of the ureter had been drawn down to the orifice of the prostatic urethra, and the transit of the bladder was thus safely accomplished. It seems important to pass the catheters as high as possible towards the kidney. The passage of three or four very fine catheters or sounds might make the result more certain.

It is difficult to explain how it was that on two successive occasions the catheters passed up one on each side of the stone. The whole operation was performed without an anæsthetic, local or general, and patient experienced only moderate pain.

The cases in which manipulative removal of ureteral stones should be attempted must always remain rare, more particularly in view of the fact that the operation of ureterolithotomy is comparatively safe. Personally I would strongly deprecate the use of all special instruments, however ingenious, as their danger increases in direct ratio to their efficiency. The method described of twisting catheters appears worthy of trial.

A CASE OF ECLAMPSIA TREATED WITH SPINAL ANÆSTHESIA.

By R. H. Paramore, F.R.C.S. Eng.,
gynæcological surgeon to the hospital of st. cross, rugby.

All cases of eclampsia are of interest, and the one here reported is of especial interest because, in spite of spinal anæsthesia, and even after Cæsarean section and decapsulation of the right kidney, further fits appeared—due apparently in part to the effect of pituitrin.

RECORD OF THE CASE.

The patient was a well-developed primigravida aged 24, seven months pregnant. She was admitted to the Hospital of St. Cross, Rugby, on March 10th, 1930, comatose from eclampsia. She had noticed swelling of the ankles and hands for three or four weeks. On the advice of a nurse who found albumin in the urine, she consulted a doctor (March 5th) but disregarded instructions. The day before admission (Sunday, March 9th) she was up and about, and helped in the cooking. At dinner she ate meat, potatoes, peas, and Yorkshire pudding. She rested in the afternoon, but at supper (9 P.M.) had more peas. At 9.30 P.M. she went to bed, complaining of headache. During the night (3.30 A.M.) she awoke her husband, complaining of feeling unwell. He discovered her in a fit on his return from fetching her mother. Two further fits occurred at intervals of an hour's duration. The doctor was called and gave the patient a quarter grain of morphia and sent her to hospital a distance of ten miles. In the ambulance she had another fit.

She was admitted at 8 A.M., and had a further fit at 9.25 A.M. Chloroform was given. Eight ounces of highly albuminous urine were obtained by catheter, but did not boil solid. A simple enema was without effect, the injection being retained. I saw her soon after; she then looked bloated and was semi-comatose and lying on her back. At 10.45 A.M. spinal anæsthesia (tropacocaine 1·5 c.cm.) was induced under chloroform; she struggled a good deal. She was kept well over in the left lateral position, and the foot of the bed was raised on blocks. At 2 o'clock her condition was rather improved, and there had been no further fit.

The next day (March 11th) she was much better. A good deal of urine had been passed and the bowels had been opened. The blood pressure was 160/95. Water, solution of glucose, lemon water, or water with sodium bicarbonate only were allowed. The day after (March 12th) she was very much better and seemed to be improving fast. Eighteen ounces of urine had been collected, but it still contained a great deal of albumin. The child was alive.

The problem of the renal state—now the central question—was considered; it was thought that the pregnancy must be terminated if the albumin did not diminish rapidly. Hot baths thrice daily were ordered. On March 13th the patient had three hot baths, and on the 14th she had one, but they seemed to do more harm than good. On the 13th she appeared still better; 38 oz. of urine had been collected but it still contained much albumin. The blood pressure was 150/100. But on the 14th she did not look so well—she looked confused. Getting to the bath and back—even with a chair—seemed to have prejudiced her recovery, and that evening the fits recurred. She had one, at 8.40 P.M., for which chloroform was given, and another at 9.14 P.M. Chloroform and spinal anæsthesia were

repeated, and it was decided to empty the uterus and incise the capsule of the right kidney.

At 10.45 P.M. Cæsarean section was done under chloroform, and a small living child (3 lb.) was delivered; pituitrin, 1 c.cm., was given. The abdominal incision was extended upwards and the intestines packed to the left. The peritoneum over the right kidney was incised and its capsule split. By a stab wound in the loin a tube was inserted to drain the kidney area. The peritoneum over the kidney was sewn up, and the abdominal wound closed in the usual manner, without drainage. Omnopon, 1 c.cm., was injected after the operation and, by some extraordinary fatuity, pituitrin, ½ c.cm., was given every four hours. The next day she did not seem to have responded to the treatment as I expected. She did not seem to be passing as much water as she should have been doing. It was not clear to me then that the pituitrin was probably the cause, but it was stopped early in the afternoon of that day. In spite of that, however, the patient had another fit at 4.5 P.M. and a further severe one at 5.40 P.M. For both of these chloroform was given, and at 6 P.M. spinal anæsthesia was induced for the third time. With the patient still under the influence of the chloroform, the rectum was washed out. Yet during the night (2.55 A.M.) a further fit occurred, chloroform and omnopon being given. This was the last. At 7.15 A.M. a simple enema produced a good result; but the omnopon was repeated as a precaution.

On March 17th the patient was much better, the urine increasing, and no further fit had occurred. On the 18th she was so much better as to appear nearly normal; she was sleeping a great deal. On the 19th she appeared to be convalescing rapidly, and only a trace of albumin was found in the urine. On the 21st she was smiling and spoke normally: the œdema had all gone and she did not remember her illness. The wound in the loin was nearly healed and the abdominal wound was normal. The temperature had remained normal. She left the hospital with scarcely any albumin on April 5th. The child did not survive the third day.

DISCUSSION.

As in two former cases,[1 2] spinal anæsthesia seemed highly efficacious in stopping the fits but in this patient the fits recurred. This is partly to be attributed to the visceral state, which was worse in this case than in the others, as shown by the œdema and the marked albuminuria. Tropacocaine, which acts by reducing the tonicity of the abdominal wall muscles and the blood pressure, cannot be expected to cause more than fleeting changes. Its effect only lasts about an hour and it is thus much more likely to be of service in the fulminating cases of eclampsia—in which a relatively sudden visceral block (to the blood flow) has occurred—than in those in which the pathological process has been progressing more gradually.

In the present case, however, two other factors seem to have come into play. The attempt to deal with the renal state by means of hot baths seems to have precipitated subsequent attacks, whilst the use of pituitrin seems to have determined their persistence. I cannot but think that the hot baths would have been without misadventure—and all for the good—could the patient have been lifted from her bed into the bath, but getting out of bed into the wheeled chair and from the chair into the bath and the return to bed were too much. The visceral block was made worse by the movements and the strain of standing.

It was amazing that the Cæsarean section and incision of the renal capsule should have been followed by further convulsions. The patient had not been fed during her illness in hospital; she had been starved, had been given only water, or water and glucose, or lemon water, and had had no milk. Not only did the fits stop but the urine increased when the pituitrin was stopped, after an interval. In this respect, the reference by Dale[3] to the "long persistent" "antidiuretic" effect of "vasopressin"—one of the active principles of pituitrin—is of interest. If pituitrin has such an effect, the action of spinal anæsthesia, which seems to favour diuresis in eclamptic cases,[4] is not likely to operate. While pituitrin acts by constricting the renal arterioles, the spinal anæsthetic operates by reducing the compression of the renal capillaries.

Reflection on these points recalled an earlier experience.

In April, 1928, I performed Cæsarean section on a multipara of 38 because she had a small round pelvis and albuminuria. It was her third pregnancy and she was in labour. Albuminuria had complicated her second pregnancy, which had ended in miscarriage. The operation was performed in the morning under spinal anæsthesia and pituitrin was injected after the child was extracted. This was quite unnecessary, for the spinal anæsthetic acted well as a hæmostatic—as Whitehouse and Featherstone[5] have recently repeated that it usually does. Throughout the afternoon the patient complained bitterly of "after-pains," and at 7 P.M. had an eclamptic fit.

It almost seems that pituitrin, when injected into women on the verge of eclampsia, induces the fits. It certainly affects the renal vessels; experimentally it has been shown that pituitrin "in a dramatic fashion" inhibits the ingravescent polyuria of the heart-lung-kidney preparation (Verney[6]). In this respect it is interesting to recall the insistence with which Nicholson[7] long ago emphasised the presence in the blood of a body acting like digitalis and at times even constricting renal arterioles to obliteration to explain the state of the kidney and the oliguria or anuria associated with eclampsia. The state of the kidney in pregnant women which predisposes to eclampsia, however, is not occasioned by a rising percentage or an increased activity of such a body in the blood, but pituitrin injected into an individual whose viscera are already in a state predisposing to a metabolic convulsion is another matter. Pituitrin is largely used in obstetric practice, and, it seems to me, rather indiscriminately. Possibly this may partly explain the occurrence of some or perhaps many cases of post-partum eclampsia.

The moral seems to be that pituitrin should not be given as a routine after labour, particularly in cases in which eclampsia appears in the least likely—e.g., cases with headache, œdema, albuminuria, oliguria. Pituitrin after labour is given to prevent or check bleeding; it should not be forgotten that bleeding at parturition is a normal occurrence and has a beneficial effect if not in excess. As a prophylactic for eclampsia, bleeding from the uterus is as efficacious as venesection. Moreover, since the blood volume increases during pregnancy and must be reduced after the delivery for the normal to be reached, the woman can well afford to lose a certain amount.

I wish to thank Dr. Kremer, the resident medical officer who was in charge, for his interest in the case reported and for his care in looking after the patient.

REFERENCES.

1. Paramore, R. H.: Proc. Roy. Soc. Med. (Obst. and Gyn. Sec.), 1928, xxi., 1334.
2. Paramore, R. H.: Brit. Med. Jour., 1930, i., 15.
3. Dale, H. H.: THE LANCET, 1929, i., 1180.
4. Arnold, J. O.: Amer. Jour. Obst. and Gyn., 1927, xiii., 118.
5. Whitehouse, B., and Featherstone, H.: THE LANCET, 1930, i., 1095.
6. Verney, E. B.: Ibid., 1929, i., 540.
7. Nicholson, O.: See Trans. Edin. Obst. Soc., 1912–13, xxxviii., 181.

SKIPTON DISTRICT HOSPITAL.—After a long local discussion the hospital committee have decided to convert a large house, named Whinfield, with additions, into a hospital which it is expected will ultimately contain 66 beds. The total cost, including that of acquisition, will be £11,150. It is proposed to extend the building by the addition of a two-storeyed block.

MEDICAL SOCIETIES

EIGHTH INTERNATIONAL CONGRESS OF DERMATOLOGY AND SYPHILIS.

COPENHAGEN, AUGUST 5TH–9TH.

(FROM A SPECIAL CORRESPONDENT.)

Eczema.

As anticipated in your columns, the discussion on the ætiology and pathogenesis of eczema proved to be the most important item on the programme at Copenhagen, and was attended by the whole Congress. It was introduced by Prof. J. Darier (Paris) and Prof. J. Jadassohn (Breslau), who emphasised the main points of their introductory papers, which had been circulated in advance. Prof. Darier took the view that eczema is a clinical entity only in so far as concerns its histology, which is that of a serous exudation in the Malpighian layers (spongiosis), whatever its cause may be. It is, in effect, an "intolerance" of the epidermis to certain stimuli, which vary in quality and degree. It is a vital reaction, and the phenomena implicated do not lend themselves to dogmatic generalisations. Prof. Jadassohn's contribution, which included a somewhat cumbersome classification, was more categorical. He withdrew from the picture the pyodermias, the reactions to fungi, seborrhœic manifestations, and the so-called lichenoid eruptions, and proposed to admit for consideration under the term of eczema only those reactions caused by chemical or physical stimuli, the histological and clinical manifestations of which are well known. They are all of an "allergic" type—that is to say, they occur only in persons of a specific susceptibility, which can be either inborn or acquired—and the causal agent (the antigen) to which they react, and which can nowadays be ascertained by various means, may be either single or multiple. The work of Prof. Bruno Bloch (Zürich), who followed as a "Co-Rapporteur" of the discussion, introduces a new phase into our conceptions of the pathogenesis of the disease, and opens up a fresh avenue of research. As already noted in THE LANCET,[1] he has succeeded in reproducing the clinical and histological picture of eczema in animals. Guinea-pigs have been permanently sensitised by cutaneous applications, intradermal and intracardiac injections of concentrated extract of the *Primula obconica*, contact with which is sometimes a cause of eczema in susceptible human subjects. It is therefore proved that the "antigen" of an eczema—i.e., its cause—can reach the skin either directly or from the blood stream, and when it is known the prophylaxis and therapy are not far to seek. The whole problem depends for its solution on the elucidation and recognition in the future of hitherto unknown causes, and these may be either of external (exogenous) or internal (endogenous) origin. Regarded in the light of these researches eczema is, in the great majority of cases, a specific reaction of the epidermal cells to *exogenous* noxæ, which can be discovered by the investigator in proportion to his care and experience in weighing up the evidence afforded by the history, occupation or trade, environment, and the way of life of the individual patient. The cutaneous tests of certain food antigens appear to be of considerable value in this connexion, and some new work by Gardner and Keston (New York), on Specific Sensitisation in Eczema, read at this Congress, comes at an opportune moment. It is suggested by Gardner and Keston that infantile eczema is the result of a susceptibility to a certain food. If this is not recognised and the reaction persists, the skin becomes more sensitive and may react to more and more antigens as the child grows, so that not only foods, but clothing material, certain pollens, and even bacteria and fungi are rendered causative in the elicitation and continuation of the cutaneous response. This is the type of eczema with which urticaria, asthma, and so on, are frequently associated. It is noteworthy that this line of research demonstrates that eczema occurring for the first time in adult life is rarely due to food, and the majority of these cases are due to direct contact (exogenous) with chemical or physical antigens, or to specific sensitisation to fungi or bacteria. An entirely new aspect of the problem was contributed by Dr. H. W. Barber (London), whose experiments with Dr. G. H. Oriel's urinary proteose have already been published.[2] If future investigations should confirm their findings, which apply to asthma as well as eczema, and possibly to other dermatoses, such as dermatitis herpetiformis of Dühring, yet another avenue of research which may influence and strengthen our therapeutic endeavours will have been opened up.

Tuberculosis of the Skin.

The subject of tuberculosis of the skin and its treatment, introduced in an excellent paper by Dr. H. W. Adamson (London), inspired the production of many of the official communications and provoked much discussion. Prof. A. Reyn (Copenhagen), Finsen's successor in the realm of actinotherapy, demonstrated superb cosmetic effects in properly treated cases of lupus vulgaris. A novel point on which he insisted was the importance of pressing the local applications of the Finsen lamp. A very short interval only should be allowed to elapse between the sessions, and in his experience it is by no means necessary to wait for the subsidence of a reaction from a previous irradiation. Better and more rapid results have followed a combination of the local treatment with the general arc-light baths. After an apparent cure, which followed in the majority of instances in from 8 to 12 months, a prolonged and careful observation for relapses must always be instituted. The more quickly these could be dealt with, said Prof. Reyn, the better the ultimate result. It was, furthermore, of the utmost importance that all practitioners should be prompt in their diagnosis and refer the patient to the proper quarter before the disease had caused disfigurement. An early lupus patch could easily be excised, and this was sometimes the most satisfactory treatment, and certainly had the great advantage of saving time and eradicating the focus. Other speakers confirmed the desirability of excision in early cases. The results of the salt-free and other dietetic measures had not been at all encouraging in Copenhagen, although Prof. O. Ganz (Heidelberg) reported considerable improvement in the exudative type of case. The gold treatment was, for the most part, also condemned, and the general opinion of X rays was that if they were used at all they should

[1] THE LANCET, August 2nd, 1930, p. 251.

[2] Ibid., p. 231.

be applied with extreme caution and only by those who had seen the serious results of overdosage, among which epithelioma had certainly to be feared.

An important paper was contributed by Bruusgaard (Oslo), who succeeded in demonstrating that quite a large proportion of lupus vulgaris in children had been contracted from cases of open pulmonary tuberculosis in one or other of the parents, the relatives, or the nurse who came in daily contact with the children. Such children always showed some pulmonary or hilus gland infection on careful radioscopy, and he was convinced that it was only very rarely that the disease was contracted by way of the skin or alimentary canal. Whenever children were exposed to the possibility of infection they should be removed to a healthy environment, or such steps taken as would render the chances of such a disaster remote. The observation by Prof. R. Volk (Vienna), that although in some cases the bovine bacillus might be the causal factor in production the greater number of lupus cases were infected with the human variety, was in agreement with the views of most authorities. According to him the clinical picture produced is thus not so much the result of a special virulence as the reaction of the patient's own tissues—i.e., his individual resistance. This picture is neither constant nor fixed, and can very easily be altered by the patient's unaided reactions—or by the injection of substances like tuberculin or sanocrysin—for better or worse. It follows, and this was emphasised by other speakers, that injections of all kinds in lupus vulgaris should never be given without a most careful and exhaustive preliminary examination of all the systems in which tuberculous foci might be lying dormant.

Erythema Multiforme.

Of the shorter communications that by Prof. E. Ramel (Lausanne) was by far the most interesting and important. He has carried his investigations on the ætiology of erythema multiforme a stage further, and it seems probable that the syndrome is yet another manifestation of tuberculosis in the human subject.

The preliminary results of "échelon" or "passage" inoculations of the blood of patients in the acute stages into guinea-pigs was reported by Ramel and discussed at a Congress of French dermatologists in Paris last year, and have also been published in this journal.[3] His claims were substantiated by another investigator, who has repeated his experiments, and who announced his confirmatory results at this Congress. Ramel has now found the tubercle bacillus by guinea-pig inoculation in the blood of 21 patients submitted to the test, and in one of these he has actually succeeded in demonstrating the organism (in films stained by the Ziehl-Nielsen method) *from the lesions themselves.* If this latter procedure can be successfully repeated by other workers the tuberculous origin of erythema multiforme, with its occasional joint and serous cavity complications, will have to be accepted as proven. The rôle of the streptococcus, which has always been regarded as causal, in this country at any rate, will then be relegated to the position of a determining or sensitising factor like sunlight, trauma, or the action of certain drugs in the antipyrin group.

Psoriasis.

Another interesting communication of a more speculative kind was that submitted by the Dutch dermatologist, Dr. v. Kerckhoff (Leiden), on the ætiology of psoriasis. In a series of histological sections stained by solutions of nitrate of silver he demonstrated the absence, or relative diminution, of melanin and pigment cells in the basal layer of the epidermis. This deficiency was noted not only in the psoriasis patches themselves, but also in the apparently normal skin of such patients. Exposure of the body to sunlight and artificial light was followed by an irregular and patchy pigmentation which demonstrated the loss of function to the unaided eye. Kerckhoff deduces from these and other complex facts that psoriasis is a "light deficiency disease"—a disease in which an inefficient oxidation is an underlying association. Such a theory is further supported by the fact that all the local applications used in treatment are more or less powerful oxidising agents, such as pyrogallol, chrysarobin, and its synthetic, standardised, and much more cleanly and powerful substitute, cignolin, which is effective in a concentration as low as 1 per cent. in the average case of the disease.

[3] THE LANCET, 1930, i., 147.

NEW INVENTIONS

AN IMPROVED FINE ADJUSTMENT OXYGEN VALVE.

I HAVE made some improvements in my fine adjustment oxygen valve, particularly with regard to the pressure gauge which indicates the quantity of gas left in the cylinder. The gauge shown in the accompanying illustration has an improved movement which obviates back lash of the pointer, and is also cheaper in production. It is built as an integral part of the valve, which does away with the comparatively expensive union between gauge and valve—a union, too, which was rather liable to develop leaks if accidentally knocked or tampered with.

The instrument is manufactured by the Manchester Machine and Instrument Manufacturing Co., Ltd., 2, Booth-street, Manchester.

K. B. PINSON, M.B., Ch.B. Birm.

TUNBRIDGE WELLS JOINT HOSPITAL.—The scheme for a joint hospital on the Culverden site is likely now to come to fruition. An amalgamation between the General and Counties and the Eye and Ear Hospitals is considered likely to help both institutions. The original scheme was declared by an advisory committee to be a sound but uneconomic one. The cost was to be £1200 per bed, but the committee found that a modern hospital could be built and equipped for £1000 per bed. Revised plans and estimates have now been presented and for 180 beds—70 more than in the two hospitals at present—the cost will be £180,000. This figure has been approved by the governors who are assured that the reduced cost will in no way sacrifice the permanent efficiency of the new hospital. An appeal to supplement the money already raised for the first scheme is to be launched as soon as the holiday season is over.

REVIEWS AND NOTICES OF BOOKS

The Autonomic Nervous System.

By ALBERT KUNTZ, Ph.D., M.D., Professor of Anatomy in St. Louis University School of Medicine, Missouri. London: Baillière, Tindall and Cox. 1930. Pp. 569. 31*s.* 6*d.*

IN view of the ceaseless output of articles and books concerned with one or other of the numerous aspects of sympathetic activity, physiological and clinical, it is well that the fundamentals of what is coming to be a highly important subdivision of medical science should be set down in a historical framework and at the same time rendered conspicuously clear. The foundation of advance must be anatomical; to postulate functions is meaningless if evidence of anatomical mechanisms whereby they can be carried out is awanting. The student of the subject must go back to the beginning, and there is the more reason for doing so in that the morphology and microscopic anatomy of the involuntary nervous system, so called, have not yet been fully elucidated. He owes a debt of gratitude to Prof. Albert Kuntz for this compact study of essentials, which is distinguished alike by its scholarliness and its reserve.

Adopting Langley's original nomenclature, Prof. Kuntz divides the autonomic system into its components, sympathetic and parasympathetic, and deals seriatim with anatomy (microscopical and general), physiology, and development; thereafter a series of chapters are devoted to the innervation of particular organs (heart, blood-vessels, respiratory system, glands, and so forth, including all the main structures of the body); other chapters handle controversial subjects such as vagotonus and sympatheticotonus, the autonomic innervation of striped muscle, and the relation of visceral sensitivity to referred pain. Finally, a sketch is given of diseased states of the system, and of its surgery. This brief conspectus gives the reader some idea of the width of range of the topics to which the author turns his attention, and at the same time must suggest to the instructed mind many points on which information is likely to be wanted. One disadvantage of the work is that the author perforce has to set down more or less dogmatically conclusions which subsequent knowledge may modify, or to draw them from insufficient data. These difficulties Prof. Kuntz has, in our view, met with remarkable skill, for he never fails to indicate in what respects knowledge is incomplete, or to outline conflicts of opinion and evidence and allow the reader to come to heuristic decisions for himself. As a single instance, he declares "it cannot be denied that muscle tonus is influenced directly or indirectly through the sympathetic nerves," yet does not omit to state how inconclusive much of the evidence is, and finally (and, as it seems, correctly) refuses the view assigning a definite (plastic) component of muscle tone to the direct effect of autonomic nerves on muscle-fibres. This fairly represents, we believe, the exact stage to which present information takes us (see THE LANCET, July 19th, p. 127). Again, judgment is suspended in respect of operations on the sympathetic system for relief of visceral pain, yet here also the far-reaching possibilities of the procedures are not ignored.

An extensive bibliography adds to the value of a work worthy of unreserved praise

Mycoses of the Spleen.

By GEORGE ALEXANDER GIBSON, M.D., F.R.C.P., Physician to the Radcliffe Infirmary and Reader in Morbid Anatomy in the University of Oxford. London: Kegan Paul, Trench, Trübner and Co., Ltd. 1930. Pp. 169. 12*s.* 6*d.*

THIS book is written to prove, in the words of the author, that "we cannot escape the main indication that acholuric jaundice, splenic anæmia and Banti's disease are infective in origin." Dr. Gibson produces much evidence in support of his thesis that the infecting organism is a mould, but it is not altogether convincing. It rests mainly upon the demonstration, by various staining methods, of structures within spleens removed during life or after death from patients who suffered from the conditions named, these structures being held to be mycelial threads. In many of Dr. Gibson's illustrations the structures do indeed appear very much like fungi; in others the resemblance is not particularly close. If we bear in mind the numerous pitfalls in the interpretation of histological appearances of this kind the evidence supplied seems far from conclusive. The bodies found in the lungs of asbestos workers look extraordinarily like minute crustacea; no one has yet been bold enough to claim that they are crustacea. In the absence of normal controls, the isolation of moulds from 7 out of 37 enlarged spleens is not impressive, and the results of animal experiments give little support to the theory. The author passes lightly over the difficulty of reconciling the hereditary disposition and the microcytosis of acholuric jaundice with the infective hypothesis. It must be remembered, however, that Dr. Gibson speaks with authority; he was one of the first to attribute a mycotic origin to certain types of splenomegaly and has devoted many years to the study of these conditions. Moreover his views have found much support, notably in France, and they are not lightly to be dismissed. The case remains unproven but the avenue requires further careful and unbiased exploration. Chapter XI. containing details of the author's own cases makes heavy reading; the subject matter here included might with advantage have been arranged in tabular form. The book includes a valuable compendium of recent French literature on splenomegaly.

On Faith and Science in Surgery.

By Sir JOHN BLAND-SUTTON, Bart. London: William Heinemann. 1930. Pp. 109. 7*s.* 6*d.*

UNDER this title Sir John Bland-Sutton has republished ten addresses delivered, between the years 1925 and 1930 inclusive, on various occasions when medical or public audiences were gathered together in the metropolis, in large provincial towns in this country, and in the United States and Canada. The various essays, in the course of publication as a collation, have been edited for the purpose and freely embellished with excellent wood engravings. All of them are fairly covered by the title, and provide striking examples of their author's manifold learning and great skill in translating that learning into simple precepts and readable information. Many discoveries and observations made by naturalists have the closest relation to medicine, and in those directions animal psychology and animal inventiveness parody the

activities of mankind, and suggest both texts to the philosopher and therapeutic measures to the doctor. Sir John's olla podrida is a reply to the double suggestiveness. He deals with foods and drugs, and with the sensations of animals that have been swallowed alive; with methods of ligature and with the mentality of conjoined twins; with "attic salt for gall-stones," and the aquatic origin of man; with "the glandular pantheon" and the conquest of sepsis—to pick out a few intriguing titles which will induce readers to consult the little volume. That indeed is the idea of this brief notice, for those who read will be repaid.

Ultra-violet Radiations and their Uses.

By ROBERT AITKEN, M.D., F.R.C.P.E., Lecturer on Diseases of the Skin, Edinburgh University; Assistant Physician in charge, Dermatological Light Department, Royal Infirmary, Edinburgh. London: Oliver and Boyd. 1930. Pp. 208. 10*s.* 6*d.*

Dr. Aitken, who has had 17 years' experience with ultra-violet light as a therapeutic agent, is well qualified to speak authoritatively on the uses and limitations of light treatment. He considers that ultra-violet radiation is valuable in the treatment of many dermatological conditions, such as alopecia, furunculosis, psoriasis, burns, and so forth, and that it is of the greatest use in the treatment of lupus. Dr. Aitken is also a firm believer in the general tonic value of ultra-violet light treatment and in its sedative action on restless patients. He discusses critically the sections of the report of the Medical Research Council (1927–28) which deal with this subject, in view of his own clinical experience and of the report of the Scottish Board of Health for 1926.

The historical and scientific sections of the book add little to our knowledge of the facts on which actinotherapy is based, and it may perhaps be questioned whether a restatement of these facts in an elementary form is justified, in view of the number of elementary text-books on actinotherapy already in existence. The statement that eosin painted on a part renders it more sensitive to light will be queried by other experimenters, since actual injection of this dye into the tissues is usually considered necessary to obtain a sensitising action.

Physiological Principles in Treatment.

Sixth edition. By W. LANGDON BROWN, M.D., F.R.C.P., Physician to St. Bartholomew's Hospital. With the collaboration of R. HILTON, M.B., M.R.C.P. London: Baillière, Tindall and Cox. 1930. Pp. 464. 10*s.* 6*d.*

THE importance of physiology in medicine and particularly in the understanding of essential principles of treatment requires to-day no emphasis. There is still, however, a tendency towards haphazard therapeutics and a lack of appreciation of the fundamental defects which treatment aims at correcting. A realisation of disorders of function must depend upon an accurate knowledge of human physiology. This volume contains a mass of sound advice and wise guidance. The book is comprehensive in scope and is written with such a full appreciation of practical issues as to be a valuable handbook of treatment. In this edition the sections on diabetes, the parathyroids, vitamins, gastric secretion, and the treatment of Graves's disease have been revised, and new work on the ovarian hormones and liver treatment in pernicious anæmia has been incorporated. A large portion of the book is taken up with a consideration of alimentary and metabolic disorders, and we miss any full consideration of anæmia and the uses of blood transfusion, or on the value of such measures as phrenicotomy and artificial pneumothorax. However, the book makes no claim to be a complete review of modern principles of treatment, and the authors are to be congratulated upon the discretion they have shown in the selection of the subject matter. Their book should be in the hands of all who would guide their treatment along rational lines.

Science in Soviet Russia.

By J. G. CROWTHER. London: Williams and Norgate, Ltd. 1930. Pp. 128. 7*s.* 6*d.*

IN a series of interesting chapters Mr. J. G. Crowther, who has already shown himself a capable exponent of scientific subjects in simple language, communicates the result of a short visit to Russia where his time was spent in the scientific institutions of Leningrad and Moscow. He acknowledges inability to speak or read Russian, so that the information which he gives, as well as his deductions, are based on communications the accuracy of which he could only check by personal observation. The outcome is a very readable account of what "science" in Russia to-day really implies, with certain well-balanced estimates of what the future may bring forth.

The limitations of the information are obvious. Mr. Crowther writes frankly from the communistic point of view, and admits that in the organisation of scientific work in the Soviet Union definite stress is laid upon the political views of the workers—in other words, those who falter in their allegiance to Soviet dispensation may at any moment find themselves without occupation. What will come of the "integration of science, the State, and the industry of the country"—the phenomenon which we are asked to envisage—may or may not be that world-power which Mr. Crowther regards as possible in 20 years time, for the accuracy of the forecast must depend upon the conditions under which this union of public interests and individual endeavour takes place. To take as an example of what is meant by "integration" we find a Government department under which certain scientists receive certain salaries to do whole-time work, the result of which will be expressed in terms of pure science or of applied science, as the work can be utilised in industrial directions. It would seem that the outcome of the particular activities must depend for its value primarily on the capacity of the men chosen to do the work, but indirectly upon the security of tenure enjoyed by the workers. Soviet Russia recognises no difference between "pure" science and "applied" science, recognising that all research work demands the same ideals of honesty, accuracy, and pertinacity; but will these ideals be reproduced materially if, to quote the author, "a purging of intellectual institutions takes place" when "'wobblies' have been given the sack."

Every page in this enthusiastic little book suggests that the vast and multiple efforts towards scientific discovery made under the creative urge of modern Russia must bear fruit in directions which imply vast national wealth and the power that will spring therefrom. But every page also suggests that the world is watching a gigantic experiment, and this at a distance from accurate knowledge of conditions which renders thoughtful surmise little better than guessing.

THE LANCET.

LONDON: SATURDAY, AUGUST 23, 1930.

THE HEALTH OF THE CASUAL POOR.

FEW small sections of the community have been so much the subject of investigation and legislation as those individuals who tramp about the country and seek shelter at night in casual wards. From Tudor times until the present there has been a long series of enactments and official inquiries concerning vagrancy and the reactions of the vagrant upon society at large. The last of these official investigations was entrusted by the present Minister of Health to a Departmental Committee, whose terms of reference were "to inquire into the administration of the laws relating to the relief of the casual poor, and to make recommendations with special regard to the assistance of persons seeking work, and to persons suffering from physical or mental disability"; this Committee, which began its work at the end of last year, has just issued a report, of which a brief summary appears on p. 415.

It is worthy of special note that in this latest inquiry the attention of the investigators is specially drawn towards the disabilities of the destitute wayfarer. Hitherto, the health of the tramp, when it has come up for consideration, has been regarded more from the point of view of the public than from his own, and from time to time he has been suspected as a disseminator of disease and generally as a "nuisance injurious to health." Thus, in 1893, and again in 1904, the late Dr. H. E. ARMSTRONG, at that time M.O.H. for Newcastle-on-Tyne, published reports in which he showed the relation of small-pox to vagrancy. Again, at the beginning of 1928 a number of cases of small-pox cropped up among persons in casual wards and accounted in some measure for the spread of the disease from district to district. On this account and by means of Circular No. 859, boards of guardians were requested by the Ministry of Health to instruct their medical officers to examine all casuals daily. This routine examination was continued for nine months during which period over 100 cases of small-pox among casuals were brought to light. At the same time a general survey of the physical conditions among casuals was made by the various medical officers, and out of 120 reports received from these officers 80 per cent. testified favourably to the physical well-being of the casuals examined. Apart from this evidence the Committee at the outset of its inquiry had no sort of statistical data upon which to base further investigations, or form conclusions about the physical disabilities of casuals; such evidence, however, as was given by the various witnesses during the course of the inquiry generally corroborated that of the medical officers referred to above. The estimates of the proportion of casuals suffering from mental disabilities, as given by witnesses, showed a wide variation; to secure some statistical information on this matter, therefore, the Committee wisely availed itself of the offer by the Board of Control to allow Dr. E. O. LEWIS of that department to undertake a special investigation on their behalf. It will be recalled that in his report, which was published by the Mental Deficiency Committee of 1929, Dr. LEWIS arrived at the somewhat startling conclusion that the mean incidence of mental defect in England and Wales was 7·34 of the population at large. The results obtained on this occasion by Dr. LEWIS from the examination of nearly 600 casuals in various representative institutions throughout the country are equally arresting, and they appear in Appendix III. of the report under consideration. Briefly, it appears that, of 592 casuals examined (including 50 women), 159 showed signs of abnormal mental condition: thus, 15·7 per cent. were classed as feeble-minded, 5·4 per cent. as insane, and 5·7 per cent. as psychoneurotic. All the mental defectives were of the feeble-minded type and no idiots or imbeciles were observed; the majority of those classed as insane were suffering from senile dementia, and several of those in the psychoneurotic group resembled cases of "shell-shock." Stammering, often severe, was frequently observed among members of this last group.

Arguing both from the accepted teaching that the incidence of mental deficiency in any group of persons is a reliable index to the amount of subnormal mentality in the group as a whole, and from his actual observations in the present instance, Dr. LEWIS concludes that the majority of casuals must be considered as persons of subnormal intelligence. If this be so it would help to explain in some measure perhaps the social inefficiency which characterises so many of the vagrant class. Several other interesting and significant observations were made about the physical condition of casuals examined during this special inquiry. Thus, the group of casuals as a whole was found to be surprisingly free from respiratory disease, and only one definite case of advanced phthisis was found; chronic alcoholism was diagnosed in no less than 75 cases; skin diseases were very rare, and as an indication of general bodily cleanliness it is recorded that, despite diligent search, only one case of scabies was found, and only very few casuals showed marks of flea-bites. From a consideration of the figures for height and weight and from other circumstances, Dr. LEWIS concludes that the nutritional condition of the casuals examined was not materially inferior to that of the general population. The total number of cases which Dr. LEWIS was able to examine in the time available is small, but his results as regards the mental conditions of casuals certainly justify the Departmental Committee in recommending, as they have, that there should be periodical inspection of casuals both by the medical officers of the

institutions to which they resort and by specialist medical officers of mental deficiency authorities. The thought that, as Dr. LEWIS computes, some 1800 mental defectives—apart from others of unstable mind—are roaming the country as destitute wayfarers is disturbing and warrants the hope that arrangements for medical examination such as the Committee recommends may be instituted without delay. On the other hand, Dr. LEWIS's observations on the bodily cleanliness, skin state, and nutritional condition of casuals are more reassuring and would seem to imply that in many casual wards, at any rate, the measures designed and carried out for the personal hygiene and bodily comfort of the casual poor have not fallen far short of the standards which the Committee would like to see generally adopted.

The report of the Committee appears opportunely, at a time when the administrative care of destitute persons has passed to new and larger authorities, armed with greater powers than had their predecessors for carrying out such medical recommendations of the Committee as may be subsequently endorsed by the Minister of Health.

MEDICAL TREATMENT OF CANCER.

DELAY in the diagnosis of malignant growths or their occurrence in such inaccessible situations that no radical cure may reasonably be expected from surgery, X rays or radium, involves the patient in a situation generally so hopeless that no systematic plan of treatment can be undertaken apart from the relief of physical suffering by sedatives. The prevailing atmosphere of gloom appears to induce in physicians a paralysis of effort which is both unreasonable and discreditable, for although it may be true that little can yet be done in the way of specific treatment for advanced malignant disease a great deal can be done for the victims of it. The paper by Dr. A. T. TODD in our present issue is a notable contribution to this neglected aspect of practice, and it is rendered particularly interesting by reason of his conviction of the value of lead selenide in the treatment of cancer. The introduction of the treatment of malignant disease by intravenous injections of colloidal lead by Prof. BLAIR BELL and his colleagues at Liverpool was first announced in 1922; but in view of the toxicity of the remedy it seemed wise to the Liverpool workers to delay publication of the methods by which their remedy was prepared and subsequently to restrict its general supply for a time. The thorough investigation of the potentialities of lead did not, therefore, take place for some time, and even then the disastrous results of the indiscreet use of the method obscured the important clinical fact that occasionally very remarkable benefit followed its employment. It is now clear from the work of TODD in Bristol and of THOMSON and SANDERS in Birmingham that occasionally in the treatment of advanced malignant disease various compounds of lead in suitable doses may produce definite improvement without subjecting the patient to the risk of the rapid deterioration of his general physical condition that sometimes followed the use of very large doses. In Birmingham and in Bristol the tentative conclusion has been reached that lead acts indirectly by stimulating some general resistance to malignant disease and, on this assumption, as Dr. TODD emphasises in his paper, it is desirable to employ any additional measures that could conceivably assist the process.

The evidence for the existence of such general resistance to invasion by malignant growth is drawn chiefly from clinical observation. Any careful observer must be impressed with the unequal progress of some fatal cases of cancer; for long periods all activity of the growth may appear to be suspended, and the patient's condition remains stationary until in a comparatively short time the disease makes serious headway. Alternating phases of this kind are by no means uncommon, and it is difficult to explain them on any other basis than that of a waxing and waning of general resistance. There is further the fact, with which radiologists are familiar, that sometimes exposure of one superficial metastasis of growth to X rays is followed within a few days by definite regression of other metastases which have been shielded from the direct effect of the rays; this suggests the possibility that absorption of the necrotic products of radiation has induced a systemic reaction to the disease. Finally, there are the few but indubitable instances of spontaneous recovery from malignant disease.

The nature of the factors underlying these clinical phenomena remains obscure, but that is no reason why physicians should not attempt to influence them favourably; such work has a value beyond the relief obtained in individual cases, for in a discouraging field it serves to keep alive that spirit of independent clinical inquiry which is the essence of medicine. Dr. TODD makes few claims. The group of workers under his guidance have not expected to cure the patients accepted for treatment, since these were advanced inoperable cases chosen only on certification that nothing could be done for them, though they were not actually moribund. The aim was to demonstrate the utility or otherwise of lead selenide in producing relief of pain, euphoria of the patient, and regression of the cancer. Only after a technique had been evolved was it hoped to apply the method to earlier cases, with less widespread growth, and therefore some hope of survival. Dr. TODD for these reasons offers no statistics, but he proceeds to describe the preparation used, the dosage in different types of cancer, the remedial effects observed in experimental animals and in man, and, finally, outlines the case for devising a technique for concurrent radiation and lead selenide therapy. Additional measures—the administration of calcium chloride, the fat-soluble vitamins in large doses, thyroid extract in small doses, and liver extract—are also used in his wards, and since it is not certain how much the interaction of these various medicaments conduces to the results obtained, he advises that none of

them should be omitted. He commends his methods to surgeons for trial (1) after recovery from irradiation, (2) after the removal of as much of the growth as possible in inoperable cases, (3) after operations regarded as complete, in case complete removal has not been achieved.

LOCAL REST IN PULMONARY TUBERCULOSIS.

THE basis of the modern treatment of all forms of tuberculosis is rest. The pharmacopœia has provided a few palliatives for some of the more distressing symptoms of the disease but has failed to supply any drug having the slightest influence on the course of the malady. The laboratory has supplied a series of vaccines, some dangerous, some at least innocuous. If collapse therapy is able to boast of occasional successes where all other forms of treatment can only record failures, it is because by its means the tuberculous lung is set at rest. Were diagnosis always made at the onset when the disease is usually limited to a small area of one lung and were the pleura less liable to the formation of adhesions, the treatment of pulmonary tuberculosis would be a simple matter. Unhappily a completely successful artificial pneumothorax is the exception rather than the rule. In some cases adhesions are already present as the result of old pleurisy before the lung parenchyma is attacked, in others they are due to localised pleurisy over recent disease. In either case they prevent the complete collapse of the lung. Sometimes partial collapse may suffice to abolish symptoms and to banish tubercle bacilli from the sputum. More commonly, however, the healthy parts of the lung alone retract, while cavities remain gaping owing to the bands which tether the diseased areas to the parietes, tubercle bacilli are still expectorated, and sooner or later there is inhalation spread in the opposite lung.

If artificial pneumothorax fails, surgical methods offer the only means of attaining pulmonary collapse. The surgical methods include: (1) Internal pneumolysis: the severance of adhesions by cautery or diathermy cutting current under endoscopic control. (2) External pneumolysis: the separation of the parietal pleura from the chest wall over the diseased area and packing of the space thus formed by paraffin, fat, or muscle. (3) Phrenic avulsion: the removal of the phrenic nerve by traction through a small cervical incision. (4) Thoracoplasty: the removal of segments of some or all of the fixed ribs from one side of the chest so as to allow the chest wall to sink in. The results of the cauterisation of adhesions in suitable cases are excellent, as witness recent papers[1] in our own columns by G. MAURER and F. G. CHANDLER. But all cases are not suitable for this treatment; the thoracoscope can only be used when there is a pleural space and general adhesions may prevent its employment. External pneumolysis seldom gives satisfactory results. The minor operation of phrenic avulsion and the major operation of thoracoplasty are those most commonly employed. The type of case most suitable for thoracoplasty is the fibrocaseous, unilateral and comparatively inactive, where an adherent pleura prevents or nullifies the benefit of artificial pneumothorax. The general resistance must be good. The patient's mentality must be hopeful and the social circumstances not unfavourable. The operation is a severe one and the general consensus of opinion is that it should be done in at least two stages. The disadvantages of two or more operations instead of one—and the disadvantage from the patient's point of view is a grave one—are held to be outbalanced by the lessening of shock and the avoidance of too sudden a strain on the contralateral lung. The results of thoracoplasty are difficult to assess. If cases are rigorously selected, if operation is limited to the more chronic types of unilateral disease, the results are good. But it is not easy to say what the later history of many of the cases would have been without operation. Many patients suffering from chronic fibroid phthisis remain for indefinite periods in fair health and activity without any special treatment. Artificial pneumothorax achieves its most dramatic successes in the acute febrile types of disease; thoracoplasty can only be offered to patients who are afebrile and in no immediate danger. Nevertheless the results claimed for thoracoplasty are impressive. Thus BÉRARD and DUMAREST,[2] in a series of 98 cases operated on before January, 1929, obtained amelioration of symptoms in 7·1 per cent., good results in 18·3 per cent., and very good results in 22·3 per cent. Since 1925 no patient has died in their clinic as the result of the operation.

Though phrenicotomy is a far less effective means of securing lung collapse it is a much less drastic procedure and it is more widely applicable. Fever does not contra-indicate its employment. The patient's resistance need not be good, for the operation entails as a rule no shock. Its value is not referable to the pulmonary base alone, for, as BÉRARD points out, a partial immobilisation of the whole organ is obtained. Phrenic avulsion should always be practised as a preliminary to thoracoplasty, it may render an apicolysis or partial thoracoplasty more efficient, and may even bring some relief to a contralateral lung which is attacked by disease after its fellow has been put at rest by surgical interference.

[1] THE LANCET, July 12th, pp. 72 and 74.

[2] Arch. méd.-chir. de l'appareil resp., 1929, iv., 498.

HOSPITAL SATURDAY FUND.—The fifty-seventh annual appeal will be made by this Fund on Saturday, Sept. 27th, which will be its flag day. Last year £83,000 was distributed among hospitals and allied institutions by the Fund.

CHARING CROSS HOSPITAL.—Last year 4160 in-patients were admitted and stayed on an average 21 days, costing £11 17*s.* 6*d.* each. The 28,146 new out-patients included 18,881 casualties; their average cost was 7*s.* 5*d.* Improvements have been carried out at a cost of £100,000, all of which has been obtained, and on an expenditure of £57,261 there was a credit balance of £1688.

ANNOTATIONS

THE PARENTAL STATE AND IMPERSONAL MEDICINE.

ADDRESSING the Ottawa Canadian Club on the theme of medicine and statesmanship last week Lord Dawson of Penn sounded a note of warning to which both the statesman and the doctor of to-day may well listen. He pointed out that the doctor of the old school thought of the sick person as a human being who, for the time being, was separated by inexplicable illness from the stream of life, and thus the doctor himself tended to become cloistered—separate in thought from the body politic. In modern times the wider appreciation of the value of preventive medicine, in response to its wider applications, had brought with it a more intimate contact on the part of the doctor with the daily life of the people, and not only of those people who are laid aside by sickness, but also of those who are enjoying health and strength. Alongside this development in medicine, Lord Dawson pointed out, there had been a similar movement in statecraft, for after the various struggles of the people for liberty and self-government the State had acquired a parental function expressed in the help provided for those who were helpless through their infancy, their ignorance, their want, or their unemployment.

The State to-day regulates wages and hours of labour, as well as cares for its weaker members, and is prompted to all this parental action by a social conscience, and in tracing out the lines of development of this function Lord Dawson forecast certain results. There was, he thought, no attribute of the human being more notable than his individuality. "Parade a thousand men and each would be found to be distinct—even to his finger-prints." By long exercise of his intuitive mind the doctor has to take cognisance of this personal factor; is not personality of equal importance to the statesman? Here the speaker pointed to the danger that might follow on the State being compelled to consider the individual "so standardised as to be hypothetical rather than real." This is a shrewd warning to many publicists to-day, who in their honest desire to see that an equality of opportunities should offer itself to the largest possible number of citizens are apt to forget that the best work will always be done when the incentive of individual stimulus is present. Attempts to standardise the human being in medicine have never been a success. Even the laboratory tests of normal function have not been conspicuously successful—the individual too often eludes the common test. Prof. Julian Huxley, in one of his earlier writings, remarked that "the essential quality of an individual is not life but individuality," and it is not a tautological platitude but a truth of physiological importance. In the sphere of practical medicine there is surely a grave danger lest the assumption should be made among those who are in social authority that all those reactions of the human personality which we call illness can be docketed on an official form and dealt with by an administrative office. No one takes this view in respect of acute emergency, but too many persons are prepared to think along these lines in branches of our science that are equally, if not more generally, important. No scientific man, and, of course, no doctor, is in danger of assuming that a series of specialist officers, in whatever profession they may be expert, could watch over and protect human destinies, but Lord Dawson's view that the State should be ready to take specialist's advice on the advisability of social departures is sound, now that the business of Imperial Parliament is so diffuse and necessarily so influenced by party considerations.

THE BLOOD BILIRUBIN IN "APOPLEXY."

THE diagnosis between cerebral thrombosis and cerebral hæmorrhage is not always such a simple matter as the text-books would have us believe. Thrombosis sometimes occurs with startling suddenness and the onset of symptoms following hæmorrhage may be quite gradual. Since the treatment of the two conditions is in many respects opposite and prognosis also differs fundamentally the distinction is one of extreme importance. Hence any assistance in the differentiation of the conditions that would supplement the results of clinical examination would be welcomed. Dr. G. Cheney [1] has recorded observations on the amount of bilirubin in the blood after "apoplexy" in a number of patients suffering from cerebro-vascular accidents. After extravasation of blood into a closed space the blood-pigment is gradually absorbed from the affected area and taken up in the blood stream. There is thus an increase for a time in the amount of blood-pigment circulating in the blood. Clearly after a cerebral thrombosis with subsequent softening of brain tissue no such absorption of blood-pigment should occur, at least to any marked degree. Dr. Cheney has followed up the original study of J. Wilder [2] in Vienna upon this assumption. In Wilder's cases the serum bilirubin was found to be definitely increased in the majority of patients suffering from cerebral hæmorrhage, and he concluded that one could determine in this way with great probability whether an "apoplexy" was due to thrombosis or hæmorrhage. Dr. Cheney reports his own series of 50 cases in which the blood bilirubin was estimated from one day to three months after the attack; in only five of them, however, was post-mortem confirmation of the diagnosis possible. The icterus index, which is a simple colorimetric estimation of the quality of bilirubin in the serum, and the van den Bergh reaction were determined in all the cases. Of the 32 patients described, 17 showed blood bilirubin above the normal; only three of them came to autopsy, and of these one showed a large subdural hæmorrhage due to trauma and the remaining two multiple small brain hæmorrhages due to uræmia. Dr. Cheney concludes that nine of the others showed some evidence of hæmorrhage; but this observation has little value in view of the fact that of the 15 who showed normal or borderline bilirubin values, at least five were probably hæmorrhage. The van den Bergh reaction was also carried out in all these patients, since a direct positive result, indicating biliary tract disorder, obviously obscures any changes due to hæmatogenous causes. Cheney's results, therefore, do not confirm the hope that the determination of the serum bilirubin is a method capable of indicating consistently the presence of cerebral hæmorrhage as against a cerebral thrombosis; on the other hand, a definite increase in the serum bilirubin (without a positive direct van den Bergh reaction) after a cerebro-vascular accident indicates the probability of a hæmorrhage. It is an interesting circumstance

[1] Cheney, G.: Amer. Jour. Med. Sci., July, 1930, p. 24.
[2] Wilder, J.: Wien. Klin. Woch., 1927, xl., 1158.

that in Cheney's series there was no constant relationship between blood-pressure readings and the type of cerebral lesions; thus many cases of high blood pressure were thought to have suffered from thrombosis, and several patients with quite low pressures were diagnosed after careful observation as cases of cerebral hæmorrhage.

WILLIAM BEAUMONT AND THE GASTRIC JUICE.

EVERY medical student has heard of the accidental wounding of Alexis St. Martin at Fort Mackinac, on Lake Huron in June, 1822, when a part of his stomach wall and of his left lung were carried away; of his recovery after a protracted convalescence even in the pre-antiseptic days, and of his resultant gastric fistula by which Dr. William Beaumont, the regimental surgeon stationed at the Fort, was enabled to carry out numerous investigations. The results of these were published 11 years later by Beaumont at Plattsburgh (F. P. Allen), and no historical summary on digestion is complete without reference to what is now considered a medical classic. Owing to the rarity of the original editions readers, however, have had to rely upon the accuracy of abstracts of this work by other authors, unless they were fortunate enough to have access to the original work. The Harvard University Press have now brought out a facsimile [1] of the 1833 edition, thus bringing within reach of all medical men this outstanding work of Beaumont. The volume is enhanced in value by the inclusion, as a preface, of a reprint of Osler's address on Beaumont delivered before the St. Louis Medical Society on Oct. 4th, 1902. Osler sketches the life of Beaumont in the United States Army, and traces the career of St. Martin until his death at the age of 75. We are told of his horror of further experiments, of his somewhat ungracious refusal to accede to Beaumont's last plea, in a letter dated Oct. 15th, 1852, to return to him in the interest of medical science, and of the manner in which St. Martin's relatives foiled the attempt to obtain an autopsy. Beaumont's life may be read in a careful and sympathetic study published by Dr. J. S. Myer in 1912, to which Osler again contributed an introduction.[2]

Owing to the uniqueness of Beaumont's experiments too great credit no doubt has often been paid to the results of his researches, and too little to those of his predecessors. Before Beaumont had written, the reaction of the gastric contents before, during, and after digestion had been noted by Carminati and Reaumur, the nature of the acid secreted was determined by Prout and confirmed in England by Children and in Germany by Tiedmann and Gmelin, and an accurate description of the gastric juice had been given by Brugnatelli and Scopoli. It is of interest to note that Berzelius, the famous chemist at Stockholm, was unable to detect any acid in the specimen of gastric contents sent him by Beaumont. Gosse, who could vomit at will, had already determined with an amazing degree of accuracy the digestibility of various foodstuffs, and subdivided animal and vegetable foods each into three classes, according as the stomach could digest them. Beaumont's observations are, however, outstanding in the care and diligence with which he pursued his work. He initiated a completely new advance in gastric physiology. His method of obtaining gastric juice was a distinct advance over the previous attempts such as killing animals, the use of sponges rejected from the stomach, and the employment of voluntary vomiters. The accidental production of a gastric fistula was quickly followed by its experimental production in animals, finally reaching perfection in the Pavlov pouch.

Beaumont anticipated many of Pavlov's results including the influence on gastric secretion of mental disturbances, the relation of the amount of food taken, and the quantity of juice secreted, and the condition of the fasting stomach. He was, however, wrong in supposing that gastric juice could be secreted through the reflex of direct stimulation of the mucous lining of the stomach.

[1] Experiments and Observations on the Gastric Juice. Facsimile edition, 1929. By William Beaumont, M.D., surgeon in the United States Army. Cambridge: Harvard University Press. 1929. Pp. 247. 12*s.* 6*d.*

[2] See THE LANCET, 1913, i., 704.

X RAYS IN FILARIASIS.

THE attention drawn by Dr. M. Weinbren [1] to the possible value of X rays in the diagnosis of *Cysticercus cellulosæ* and *Trichinella spiralis* renders opportune a reference to the likelihood of their increased uses in filariasis as suggested by work of F. W. O'Connor, Ross Golden, and Hugh Auchincloss.[2] These writers recall the observations of others that *Filaria bancrofti* may be present, particularly in groin and epitrochlear glands, in large numbers both alive and more or less calcified. On several occasions O'Connor has laid stress on the presence of a small painful area in the distal part of a limb, the pain increasing in intensity with an attack of lymphangitis or elephantoid fever, which was believed to be filarial in origin. He further found that on excision of the skin and subcutaneous tissue comprising such an area in a lymphangitic patient adult filariæ were present in the subcutaneous fat of the excised portion, which, of course, contained no lymphatic glands. After excision symptoms disappeared, and had not returned during a year's observation. It was also noted that in a piece of excised subcutaneous tissue living and calcified worms were frequently found associated, so that the question arose whether the detection by X rays of calcified worms might not be a guide to the situation of living ones. A spermatic cord removed at post-mortem examination was subjected to X rays because microfilariæ were present in the associated hydrocele. Shadows were present in the cord, and were shown to correspond to calcified worms. The way was thus opened for clinical investigation on a woman of 30 who had had attacks of elephantoid fever for 20 years, and in whom elephantiasis was established. She had a tender area on the inner side of the left thigh about 4 in. above the femoral condyle. In this region X rays showed three shadows, each 3–4 mm. long by 1 mm. broad. One lay in Hunter's canal and the other two close together in the subcutaneous tissue on the site of focal tenderness. The skin and subcutaneous tissue comprising this area were excised; as were two other blocks of tissue, one on the front of each leg which had shown local tenderness but no shadows. The results of microscopic examination of part of the tissue from the thigh are reported. Calcified worms were found 1 cm. below the surface, encapsuled in concentrically arranged fibrous tissue; the inner aspect of this capsule showed no evidence of endothelial cells, while the connective tissue round it contained numerous engorged blood-vessels with greatly thickened middle coats. There was no local eosinophilia, nor had previous blood examination detected either blood eosinophilia or microfilariæ.

[1] THE LANCET, 19 , , 1433.

[2] Amer. Jour. Rontgenol. and Radium Therapy, 1930, xxiii., 194.

Apparently none of the filariæ were alive when excised; at least there is mention only of partly calcified specimens, though this change was not in all cases extensive enough to throw a detectable X ray shadow. In some other cases of elephantiasis reported upon, shadows corresponding to those thrown by calcified filariæ were found in considerable chains. It is clear, then, that numbers of *F. bancrofti* may lie scattered in the subcutaneous tissue or strung out in distal lymphatic vessels. It is also pointed out that even extensively calcified specimens are hard to detect unless the limb has been so arranged that they lie in its profile. Nevertheless, the belief is expressed in the paper that since excision from an elephantoid limb of areas containing living worms has improved symptoms, the X ray demonstration of calcified filariæ may aid in localising the attack on the disease.

AN OFFICIAL CORRECTION FROM THE M.R.C.

PENDING a reply from their American house the Sandoz Chemical Works, Pharmaceutical Department (5, Wigmore-street, London, W. 1), desire us to publish the following extract from the *Pharmaceutical Journal* of Feb. 20th, 1926:—

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN: THE PHARMACOLOGICAL LABORATORIES.

(Text of a pamphlet which is being supplied to inquirers by the Secretary of the Society, 17, Bloomsbury-square, London, W.C. 1.)

These laboratories are now in a position to test the drugs and preparations dealt with in detail hereafter.

3. *Ergot.*—Samples of ergot will be accepted to be tested in the form of the powdered ergot. The Geneva Conference has made no recommendations in the matter of ergot. The chief active substances which may be present in extracts are ergotamine (or ergotoxin), histamine, and tyramine. It will be assumed that the therapeutically active substance is the specific alkaloid ergotamine, and a test for its amount will be applied to an acid alcoholic extract of the powdered drug.

As standard a sample of ergotamine tartrate is available, prepared by the Sandoz Chemical Works, Basle.

The test applied will be the capacity of an acid alcoholic extract prepared from the sample to reverse the action of adrenaline either on the blood pressure of a pithed cat or on the isolated uterus of the rabbit. After consultation with the Director of the Department of Biological Standards, Medical Research Council, it has been decided to approve as good samples of ergot those containing not less than 1 mgm. per gram of the specific alkaloid.

INSULIN IN OIL.

IN the treatment of diabetes mellitus the ideal towards which the physician strives is to keep the blood-sugar of the patient within normal limits throughout the 24 hours. The attainment of this ideal is often prevented because insulin, as usually administered in aqueous solution, is completely absorbed within eight hours of injection. Several attempts have been made to overcome this difficulty by incorporating insulin with some vehicle which will delay the absorption of the hormone. Some 18 months ago Dr. O Leyton described in these columns[1] some experiments with a suspension of powdered insulin in castor oil, in the proportion of 100 units to each cubic centimetre. He found that the period of absorption was increased to as much as 16 hours and that correspondingly large doses of insulin could be administered in this way without provoking hypoglycæmic symptoms. More recently, M. Labbé, R. Boulin, and H. Goulié have worked on the same lines using olive oil containing 20 units of insulin per cubic centimetre. They examined[2] the blood-sugar curve after 20 units of this suspension, and after the same dose of aqueous insulin, but found little difference between the two curves. They also observed that in diabetics on a fixed diet the glycosuria increased when the oily preparation was substituted in similar doses for ordinary insulin. They conclude that oily suspensions of insulin do not retard absorption. The results of most other workers, however, tend to support Leyton's opposite conclusion, although there is no general agreement concerning the degree of delay which can be obtained. Apart from this question the use of oil as a medium for subcutaneous injections is not entirely free from objection. Vegetable oils such as castor oil do not usually excite any notable inflammatory reaction in the surrounding tissues, but it is often a matter of weeks before the oil is completely absorbed—an obvious objection in circumstances where repeated injections are necessary.

[1] THE LANCET, 1929, i., 756.
[2] Bull. et. mém. de la soc. méd. des hôp. de Paris, July 7th, p. 1190.

MILK FEVER.

THE last of this year's Goulstonian lectures[1] on the significance to clinical medicine of studies in calcium and phosphorus metabolism was concerned partly with the contribution to therapeutics of the researches which Dr. Donald Hunter had described. The use of calcium therapy in tetany, lead poisoning, œdema, and acute necroses of the liver was discussed with reference to human patients, and a brief concluding section noted the work of Prof. H. Dryerre and Prof. J. R. Greig[2 3] on the milk fever of cows. At the International Veterinary Congress, held in London from August 5th to 9th, Prof. Greig gave a historical account of the steps whereby the ætiology of this curious condition has been elucidated.

Milk fever is a disease of sudden onset which attacks milk cows, producing partial or complete prostration and paralysis of the hind quarters, sometimes also of other parts. Primiparæ are rarely affected. The period of greatest susceptibility in the milking life of an individual cow corresponds to the period of greatest milk secretion. Many hypotheses have from time to time been formulated to explain the nature of milk fever. On the theory that the cause was an infection J. J. Schmidt in 1897 injected into the udders of a series of cases a solution of iodide of potassium, which was at that time believed to have antiseptic properties. The treatment met with remarkable success, and reduced the mortality from the disease from 60 or 70 per cent. to 15 per cent. Later a modification, devised by Andersen (Skanderborg) and others, replaced the injection of fluids by mammary inflation, and to-day the mortality is less than 1 per cent. But while a specific cure for the disease had been discovered empirically, the cause of milk fever remained a mystery until, in 1924, Prof. Dryerre and Prof. Greig began to investigate the pathology of the condition, starting with the fact that specific cure resulted, no matter whether antiseptic fluids, sterile water, oxygen or air were injected into the udder. They decided that simple distension of the mammæ must act either (1) by eliciting some endocrine disturbance, or (2) by mechanically retarding or arresting milk secretion, and so preventing the loss in the milk of some substance vital to the organism. It occurred to them that the colostrum of the cow is rich in calcium, and that the onset of a profuse lactation might occasion a rapid reduction in the concentration of the blood calcium. This idea seemed to be supported

[1] THE LANCET, 1930, i., 526, 897, 947, 999.
[2] Vet. Record, 1925, v., 225; 1928, viii., 721.
[3] Greig, J. R.: Vet. Rec., 1929, ix., 509; 1930, x., 115.

by the further observation that the spastic seizures in the early stages of milk fever were often tetanic in character. Since not every heavy milking cow was subject to the disease some other factor, such as parathyroid dysfunction, was postulated as a predisposing cause.

The story of the gradual confirmation by experimental evidence of this main hypothesis and the disposal of other theories that at one time looked equally probable is a fascinating one. While the blood calcium content of normal parturient or lactating cows is 9 mg. to 11 mg. per 100 c.cm. serum, that of 82 cows attacked by milk fever was found to give an average value of 5·13 mg. The degree of the severity of the symptoms, moreover, bore a distinct relation to the calcium level in the blood, while the blood-calcium concentration in bovine diseases other than milk fever was normal or only slightly below normal. Inflation of the mammæ of normal lactating ewes was found to cause a rise in the blood calcium of about 10 per cent., and finally in 15 cases of milk fever successfully treated by mammary inflation this procedure invariably caused a rise in the blood-calcium value. In Prof. Greig's view the curative effect of mammary inflation may be due to its mechanical effect in preventing the further interchange of calcium from the blood to the gland acini, and also to the forcing back of the calcium, which is heavily concentrated in the gland, back into the blood. This method of treatment, however, is now likely to be superseded by direct calcium therapy. In 1928, when seeking for a bland form of calcium which could be injected without producing local irritation, Prof. Greig found that calcium gluconate (Sandoz) produced little or no irritation even when injected subcutaneously. In a series of over 100 cases of milk fever the great majority have been rapidly and completely cured with a single injection of this preparation, and in only three cases did it fail to produce a markedly beneficial response; in these the technique is blamed. It has also been found possible to abort a commencing attack of milk fever by flooding the blood with calcium upon the first appearance of the symptoms. Observations suggest that the disease may be prevented by commencing a massive administration of vitamin D a few days before calving. The fact that not only milk fever in cows, but lambing sickness in ewes, and transit tetany in mares are all rapidly cured by mammary inflation, and that these are the only conditions, in an examination of over 500 samples of blood, in which an acute hypocalcæmia has been found, suggests strongly that the essential cause of milk fever is an acute blood-calcium deficiency, and that the specific curative action of mammary inflation consists in raising the blood-calcium values.

UNIFORMITY IN RECORDS OF MATERNAL DEATHS.

THE world-wide effort to reduce maternal deaths associated with childbearing suggests that a uniform system of classifying such deaths ought to be devised. British obstetricians have recently drawn attention to the lesser mortality in Scandinavian countries and in Holland when compared with that of England, but we cannot be sure that we are comparing like with like. Even England and Scotland classify these deaths on different methods, so that not even English and Scottish towns can be compared. In the annual reports of medical officers of health noticed on another page it is shown that Derby has a maternal death-rate of 3·7, or of 6·3 per 1000 births, according to the system of classification adopted, and the report from Liverpool points out that the inclusion of 21 additional deaths associated with childbirth would raise that city's rate from 3·5 to 4·6. The Edinburgh figure of 7·0 cannot be taken as comparable with the Liverpool figures. An obvious anomaly in the official method of calculating this death-rate is that although the deaths include those from sepsis and other complications following abortions and stillbirths, the rate is calculated per 1000 live births, instead of per 1000 of all terminated pregnancies. Stillbirths are now registered, but the number of abortions is not known. The figure for all terminated pregnancies is, therefore, not available. It would be possible, however, to keep separate the deaths due to abortion, and in view of the increasing number of these deaths this course appears to be desirable. It is, we believe, already practised in many towns and districts in Germany, and in the departmental committee's report on maternal mortality and morbidity recently summarised in our columns the distinction is made in many of the tables compiled. Excluding the deaths from abortion, it would seem proper practice to record the number of these maternal deaths per 1000 live and stillbirths. The main difficulty appears to be the decision which deaths should be recorded as due to childbirth and which as merely associated with childbirth. It ought to be possible to find a way to state the facts so that maternal mortality of various countries and districts can be compared, and a scheme to this end might well be compiled by some interested body, for example by the Health Committee of the League of Nations.

LONDON COUNTY CORONERSHIP CHANGES.

THE retirement of Sir Walter Schröder and Mr. H. R. Oswald from their coronerships at the end of October will end the public service of two officers who have set a high standard of ability and judicial temper. Sir Walter Schröder had many years of experience as deputy before he was appointed coroner for the central district of the County of London 20 years ago. Past president, and now honorary secretary, of the Coroners' Society, he was at one time in charge of the recent edition of "Jervis on Coroners"; many of the notes in that invaluable book are believed to incorporate his opinions. Mr. Oswald's service, almost as long, is not less distinguished; appointed as coroner for the western district in 1919, he had been coroner for the south-eastern district since 1902. The London County Council has expressed its warm appreciation of the admirable work of these two officers; with this expression all concerned will wish to be cordially associated.

These two retirements are of more than personal interest. The London County Council will now be able to reach a further stage in its reorganisation of coroners' districts. The Act of 1926 abolished franchise coronerships (except the offices of the King's coroner, the coroner of the King's Household, the coroner for the City of London, and the coroner for the Isles of Scilly) as from the next vacancy. Within the County of London the dean and chapter of Westminster have their own coroner who, on their appointment, has been coroner for the city and liberty of Westminster. The Duchy of Lancaster has franchise coronerships in London also, the possessions of the Duchy being by no means limited to the north of England but ranging as wide as the former properties of the great John of Gaunt. The Chancellor of the Duchy can, under the 1926 Act,

relinquish his right of appointment by deed under his hand and seal on His Majesty's behalf. Gradually these franchise coronerships will disappear and the programme of regrouping the London districts will proceed. The London coronerships, becoming whole-time offices with systematic superannuation and compulsory retirement arrangements, will continue to be posts of great importance. As the vacancies are filled it will be possible to see what further requirements are stipulated for by the London County Council beyond the statutory qualification (five years' standing as barrister, solicitor, or legally qualified medical practitioner) laid down in Section 1 of the Act of 1926. A coroner with medical qualifications often possesses the additional legal qualification (perhaps less laboriously attained) of having been called to the Bar. It would not be unreasonable to insist that a barrister or solicitor, before being accepted for appointment as coroner for a London district, should also be able to produce evidence of medical knowledge.

FRENCH MENTAL HOSPITALS.

THE study tours organised by the Royal Medico-Psychological Association are proving of the greatest interest and educational value to those privileged to participate in them. Dr. A. E. Evans has once more benefited the less fortunate majority by writing a description of the latest tour to the department of the Seine.[1] The French Lunacy Act of 1838 provides for admission to asylums voluntarily, on request signed by some relative or friend, and by certificate, signed by a doctor. As the cost falls on the departments and townships, some counties only accept as voluntary patients those who can defray the cost. The certificate applies particularly to dangerous cases and the reception order is made by the Prefect of Police. The patients then go to the admission department of L'Asile Ste. Anne, where a new certificate is made out by the senior physician, and thence to the appropriate institution, where the patients are again certified, a certificate recommending detention being supplied 15 days later. Reports are sent to the Procureur (the public prosecutor) every month, and he visits the patients every six months. Discharge is proposed by the senior physician and authorised by the Prefect of Police. Voluntary patients can leave forthwith on the petition of the person who requested admission or on a certificate of recovery from the senior physician. At the hospital of Henri Rouselle patients enter and leave freely without any legal formality. For children there is a dispensary which functions as a hospital. The recovery-rate for the asylums of the department is 45·6 per cent. and the death-rate 12·3 per cent. for the year 1927.

Dr. Evans describes visits to L'Asile Ste. Anne, the Hôpital Henri Rouselle, L'Asile de Villejuif, Maison Blanche, and L'Asile de Vaucluse. The Paris centre for mental prophylaxis consists of a central dispensary for examination, classification, and treatment; a mental hospital for observation and treatment; a social service to follow up cases; a department for home visitation by specially trained assistants; laboratories; an institute of psychiatry and a school of mental prophylaxis for training workers. The International Congress of Mental Hygiene was meeting in Paris at the time of the visit. Among the papers read was one putting forward proposals for the improvement of psychiatry in France. It was suggested that the State should coördinate and control all activities, and that an advisory national council for mental prophylaxis and a national institute for training and research should be formed. Each department would have a centre, on the lines of the one existing in Paris, to include a hospital for dangerous patients and another for harmless, long-standing, and curable cases; a hospice or colony run on open-door principles for the incurable and feeble-minded; a home for patients who need segregation; a special establishment for antisocial or criminal patients; and facilities for research and the teaching of mental prophylaxis. Home treatment with money payments would be provided for and particular attention given to the selection of suitable employment. The proposals also suggest that the dispensaries should have advisory functions relating to eugenics, delinquency, prostitution, vagrancy, and immigration.

Occupational therapy, which was such a feature of the Dutch mental hospitals visited in 1928,[2] is not extensively used in France. Le Patronage de l'Enfance has as its object the protection of orphans or children in unsuitable surroundings and of delinquents. Every child has a psychological examination, and the principal medical officer of the neuropsychiatric clinic gives directions for future care. Over 60 per cent. of the children are found to have some mental abnormality. At L'Asile de Villejuif there is a special section for criminal types of patients, many of them high-grade feeble-minded delinquents. Dr. Colin, the superintendent, was specially interested in these people and knew of some 200 of them who were improperly housed in prisons or asylums. He was able to open two blocks for men in 1910. Each patient has a single room with fixed bed and some suitable occupation. Everything is designed to prevent the concealment of knives and forks, and the tools in the racks form a pattern which makes the absence of any one conspicuous. At the Maison Blanche, an institution opened in 1900 for women only, there was an interesting type of impervious floor made of sawdust, magnesite, and magnesium chloride. Nurses are instructed, and examined by written paper and orally in administration, hygiene, sick nursing, anatomy, physiology, psychology, mental nursing, and pharmacy. The salaries are about 1000 francs a month. At Maison Blanche there is a creche for the young children of married nurses; quite a number of the nurses are married women. The main impressions summarised by Dr. Evans are: the single portal for all mental patients; the pleasing, well-lighted, and ventilated wards; the separate buildings of single rooms for noisy and dangerous patients; the lay directorship, which does not seem calculated to encourage initiative in medical welfare or pathological research; the well-chosen diet; and the attention given to prophylaxis.

Sir Charles Martin, whose Croonian lectures on the thermal adjustment of man to external conditions we are about to publish, leaves for Australia at the end of the year to take up the position of Director of the Division of Animal Nutrition under the Commonwealth Council for Scientific and Industrial Research. This Council is a reflection of the Department for Scientific and Industrial Research in this country, and its laboratories are situated in the grounds of the University of Adelaide, field experiments being conducted in various parts of the continent where an assortment of nutritional troubles are encountered by stock-raisers.

[1] An Account of a Tour of Some Mental Hospitals and Clinics of the Department of the Seine. London: Adlard and Son, Ltd. 1930. Pp. 18. 1s.

[2] THE LANCET, 1929, ii., 936.

CLINICAL INTERPRETATION OF AIDS TO DIAGNOSIS

A Series of Special Articles, contributed by invitation.

LXXXII.

THE CLINICAL SIGNIFICANCE OF SLIT-LAMP APPEARANCES.

PART II.*

The Conjunctiva.

IN the normal conjunctiva we are able to observe with the slit-lamp the circulation of the blood in the finer vessels, more especially those at the limbus. The nerves may be made apparent. As a senile change, pinguecula may be observed earlier than by other means. In injuries to the eye a small perforation of the sclera by a flying fragment may be suspected when we find a dark subconjunctival hæmorrhage that has arisen from injury to branches of the anterior ciliary vessels. The peculiar cystic appearance of scars after a trephining operation may be examined. It will be found that they are always associated with pigment scattering throughout their walls. In cases of argyrosis the pigment will be seen to be in the epithelial layer of the conjunctiva, likewise the pigmentation seen in siderosis. The pigment in Addison's disease will be seen as patches, in the interpalpebral space, in the conjunctiva only.

The Cornea.

When examining the cornea it is necessary to eliminate the reflex from its surface, in the same way as in ordinary examination in focal light; that is, observation in the direction of the direct reflection of light is avoided. This is achieved by illuminating at a relatively high angle the portion of the cornea to be examined, and making an observation in the direction of the optic axis. The cornea may be examined by transillumination, by the light reflected from iris and lens, and the method of examination in the zone of specular reflection may also be applied. Observations have been made on the thickness of the cornea, and figures obtained by this method are at a variance with those obtained by post-mortem examination. Post-mortem measurements suggest that the cornea is 0·8 mm. to 1 mm. in thickness, whereas the figures obtained during life are from 0·583 mm. to 0·641 mm.

In the normal cornea the optical section, sufficiently narrowed, will reveal that the epithelial layer may be distinguished from Bowman's membrane; that the corneal stroma is not homogeneous. Nerves will be visible, and if the posterior band of the cornea, that reflected by the posterior surface, be examined in the zone of specular reflection the endothelium of the cornea arranged as a mosaic may be seen. An important congenital condition is buphthalmos, and here besides the bedewing (œdema) of the epithelium, we are able to distinguish ruptures of Descemet's membrane, mainly by their sinuous course, bright edges, and absence of endothelium upon their posterior surface of the cornea where the rupture has occurred. Arcus senilis as a senile change is seen earlier than by other means, and a faint haze in the neighbourhood of the cornea will be seen in the optical section. Among important traumatic lesions it is possible to decide whether a foreign body has perforated the cornea, so that it lies partly in the cornea and partly in the anterior chamber. This point is of considerable importance when deciding the means which should be adopted for its removal. A minute examination may be made of the posterior surface of the cornea which will be found powdered over with tiny particles of uveal pigment after a contusion.

Perforating wounds will be distinguished by the fact that folds are produced in the membranes of Bowman and Descemet. Folds of the structureless membranes of the eye have been elucidated by the peculiar behaviour of the reflexes produced. This phenomenon is well exemplified by considering the transparent paper in which it is the habit to wrap soap, food, and chocolate boxes. So long as this paper is perfectly flat it is invisible, but when thrown into folds it produces twin reflexes. The structureless membranes in the eye are the membranes of Bowman and Descemet, the capsule of the lens, and the retina, and all these when folded are visible by the reflexes they produce. In siderosis of the globe the corneal optic section is yellowish in colour. Alterations in the thickness of the cornea are easily appreciated when a narrow optical section is produced. Thinning is usually produced by loss of the anterior surface, as in ulceration, thickening by an infiltration that causes a bulging background of the posterior surface into the anterior chamber, as in disciform keratitis.

BEDEWING OF EPITHELIUM AND ENDOTHELIUM.

Two important phenomena are well demonstrated by the slit-lamp—namely, bedewing of the epithelium and endothelium. These are well seen by transillumination, the cornea appearing to be covered in droplets of fluid. Epithelial bedewing has been well known, for instance, as a condition accompanying glaucoma, but the importance of endothelial bedewing has been shown by means of the slit-lamp. It gives the appearance of much finer droplets than when the epithelium is affected and has been shown to be an early sign in diseases of the uveal tract. The endothelium in these circumstances when it is examined in the zone of specular reflection, shows that the sharp outline of the cells has been lost and that characteristic islets appear. Upon these islets precipitates form, and in this way the earliest stages of deposits upon the posterior surface of the cornea ("K.P.") are detectable.

Little of importance has been shown by the examination of corneal scars. Vascular changes are easily examined, best by transillumination. In this way not only may the superficial and deep vessels be distinguished but the movement of corpuscles may be followed by quite low magnification. In all inflammatory conditions the nerves are unduly prominent. Corneal precipitates are easily examined and their early appearances noted, so that early indications of uveitis may be detected long before grosser precipitates may be seen by the loupes in common use. It is interesting to note that the precipitates which accompany heterochromic cyclitis are always grey in colour. Although pathological pigmentation of the cornea was known before the introduction of the slit-lamp, we are now able to see these changes more regularly. A transverse pigmented line (Hudson's brown line) is seen in certain corneal opacities. Stähli has described a similar line occurring in an otherwise normal cornea. Fleischer's ring is characteristic of conical cornea whose base is

*Part I. appeared last week.

partially or wholly encircled. Kayser's ring is seen in Wilson's disease (hepato-lenticular degeneration) and occurs in Descemet's membrane. A fusiform deposit of pigment grains (Krukenberg's spindle) occurs on the back of the cornea in certain cases of myopia. By means of the slit-lamp our knowledge of conical cornea has been increased and certain small constant features discovered. In Fuchs's epithelial dystrophy changes in the endothelium as the earliest signs have been established. In disciform keratitis the backward bulging of the posterior parts of the cornea is well seen, as well as the frequent localised exudate upon the most prominent part of the bulge. Finally, an early diagnosis of parenchymatous keratitis is possible, even before any injection of the eye has occurred, for the cornea shows epithelial bedewing, cloudy opacities, and localised thickening.

The Anterior Chamber.

The only method of examination that can be used for the anterior chamber is that of focal light. It is possible, however, to examine the aqueous by the beam projected through it, against the unilluminated background. In this way we may see floating particles, uveal pigment, blood corpuscles, and so forth. These particles are seen to be in constant movement, rising in front of the iris and falling behind the cornea. They demonstrate thermal currents in the aqueous, due to the fact that the aqueous in contact with the iris is warmer than that in contact with the cornea. This phenomenon is the explanation of the Erlich-Türk line seen on the back of the cornea after injecting fluorescein into the vein of the rabbit's ear. A deposit of cellular elements, apparently white blood corpuscles, is seen in 50 per cent. of children along this line. The deposit of uveal pigment on the back of the cornea in cases of Krukenberg's spindle is also along this line.

Persistent pupillary membrane is often visible with the slit-lamp and is found to be much commoner than was previously thought. After contusions of the eye pigment granules are seen in the aqueous. In subluxation of the lens a prolapse of vitreous is seen protruding through the pupil, always covered with brown pigment granules. Slight changes in the aqueous are seen early even before actual particles are visible. A change in the constitution of the aqueous is shown by the visibility of the beam of light as it passes through the anterior chamber (flare). Any doubt as to the presence of an anterior chamber after an operation for glaucoma may be easily settled by observing if there is any gap between the light reflected by the cornea and that by the lens or iris.

The Iris.

In the examination of the iris focal light and the method of transillumination may be used, since the iris has behind it a reflecting screen in the lens, especially if it be opaque. It is easy to observe, in irides not too heavily laden with pigment, that the iris consists of three layers; the retinal pigment layer is visible at the pupillary margin, the anterior mesoblastic layer extending from the ciliary border to the collarette, and the posterior mesoblastic layer from the collarette to the pupillary margin. At the junction of the anterior and posterior mesoblastic layers the angle of Fuchs is seen. It is from the collarette that the remains of the pupillary membrane arise and their marked elasticity will be appreciated as the pupil alters in size. The sphincter iridis may be seen in pale irides if the iris be illuminated by a well-focused beam in its immediate neighbourhood on the pupillary side (indirect illumination). The common congenital anomalies are those seen in connexion with partial or complete coloboma. This usually occurs below and when complete the retinal pigment layer will be seen along the edge of the coloboma. When incomplete we may have an aplasia of the anterior mesoblastic layer or merely a pit. In melanosis of the iris the surface of the iris may show an irregular surface and the fact that the iris is hyperpigmented is known by the particles of pigment seen on the sclera at the point of perforation of the anterior ciliary vessels and possibly in the fundus. Senile modifications are commonly seen and consist of atrophic changes and disintegration of the pigment. In atrophy when the iris stroma becomes thinned and loses a good deal of its pattern the iris becomes slaty gray, due to the retinal pigment layer shining through. The sphincter iridis may become unusually visible. Disintegration of pigment is a constant senile change. This may be seen at the pigment border and elsewhere in the retinal pigment layer. The result is that the iris becomes translucent in these situations and the pigment becomes scattered over the surface of the iris, the lens, and the posterior surface of the cornea and may be seen moving in the thermal currents of the aqueous. The suggestion in the past that these changes have a relation to cataract and glaucoma is probably erroneous. In injuries to the eye the iris may be involved, showing ruptures of the pupillary margin or hæmorrhages into the substance of the iris that may be seen only by indirect illumination. Many years after a blow upon the eye the iris may become darker in colour. In perforation of the iris in intraocular foreign bodies the hole may be observed by focal light and transillumination through the sclera when a red glow will appear in the perforation.

Interesting points have been raised in connexion with exudative changes in the iris. Apart from tuberculous and syphilitic nodules, certain other nodules are seen near the pupillary margin, especially in chronic irido-cyclitis. Since similar nodules have been seen on strands of pupillary membrane quite apart from the iris they are apparently of the nature of precipitates. Their transitory nature also tends to support this view. As a result of inflammation atrophic and pigmentary changes are seen in the iris. These are often present in the neighbourhood of posterior synechiæ. In heterochromic cyclitis the iris becomes much paler in colour. Early pigmentary disintegration is seen by transillumination.

CHARLES GOULDEN, O.B.E., M.D., M.Chir. Camb., F.R.C.S. Eng.,

Ophthalmic Surgeon to the London Hospital; Surgeon, Royal London Ophthalmic Hospital.

SUNDERLAND'S MEDICAL SERVICES.—Dr. A. Stuart Hebblethwaite, medical officer of health for Sunderland, has prepared a scheme for the reorganisation of the medical services of the borough in consequence of the transfer of the medical functions of the public assistance committee to the health committee. Dr. Hebblethwaite points out that there is need for a fully developed municipal hospital with the same staff and standard as the present voluntary hospitals which have long waiting-lists, growing rather than diminishing. He suggests that the municipal hospital at Highfield should be made a central clearing station for the town, from which all cases requiring hospital treatment could be sent to suitable institutions. This would ensure complete coöperation between the present voluntary hospitals and the municipal hospitals, and would avoid the overcrowding of the one and the depletion of the other. He further recommends that all surgical operations upon patients in the municipal hospital should be performed there instead of sending them to the voluntary institutions.

SPECIAL ARTICLES

THE CASUAL POOR.

A STUDY OF ECONOMIC AND SOCIAL FAILURE.

THE recent report of the Departmental Committee on the Relief of the Casual Poor [1] includes the result of an investigation by Dr. E. O. Lewis of the types of person who fall into this category. As about 12,000 casuals are relieved in England and Wales on any one night it was necessary to conduct the inquiry on some plan which would give representative results, and for this reason Dr. Lewis and his colleagues visited 15 casual wards in various Welsh and English towns, and interviewed 592 persons in all. It was an investigation, in essence, of those men and women who have failed economically and socially and the reasons for such failure may be either physical infirmity, mental infirmity, temperamental defects, psychoneurosis, criminal tendencies, or merely overwhelmingly adverse environment. To assess the important factor in any individual case and during a brief interview was a matter of difficulty, especially as the chief object was to ascertain the proportion of casuals who could be classified as persons of abnormal mentality. Dr. Lewis appears to have given borderline cases of both mental deficiency and insanity the benefit of the doubt; so that his figure for the incidence of feeblemindedness is probably rather low. His difficulties were increased by the extremely limited field of interest, and the ignorance, sometimes illiteracy, of many of the casuals, which made the application of any large number of standardised tests out of the question. The interview was conducted as an informal talk from which it was possible to make some estimate of the mental capacity; if this appeared to be normal a rapid physical examination was made of the chest and the man was dismissed. Dr. Lewis observes that the most cursory physical examination was appreciated as a sign of good faith, while if the subject had an inkling that a mental investigation was being made he regarded it as a personal affront. As the women in the casual wards were few in number it was decided to include Southwark Casual Ward, where special arrangements are made for the reception of women vagrants in the London County area.

MENTAL DEFECT.

Among the group of 592 casuals investigated, 93, or 15·7 per cent., were mentally defective, and from this it was estimated that there are about 1800 mental defectives nightly in casual wards in England and Wales. There was a complete absence of imbeciles and idiots, who would have been lacking in even the small degree of intelligence necessary for a vagrant life. The casual with the lowest intelligence examined had a mental age of 7, but most of those who were mentally defective had mental ages of 8 or 9. There was a tendency among them to attach themselves to other vagrants of better intelligence, sometimes to their advantage; occasionally, however, their disability was exploited by an unscrupulous companion. Most of them were subnormal in physique, and showed less foresight than their fellows in the care of their feet; their clothing with few exceptions was below the average of that of most casuals. Among the 50 women examined the incidence of feebleminded-ness was slightly higher than among the men.

The impression formed of the mental capacities of most of those who did not fall into the mentally defective group was one of subnormality; men and women of normal or supernormal mentality among them formed a small minority. Such a conclusion, Dr. Lewis points out, should be borne in mind when formulating plans to prevent the social failure of such persons in the future; their inefficiency even as unskilled labourers makes them incapable of retaining a situation long. The total number of insane casuals interviewed was only 32, of whom 20 were cases of senile dementia; the remainder included 2 cases of dementia præcox, 4 of manic-depressive insanity, 3 of toxic psychosis, and 3 of paranoia. In only two cases was the condition so severe as to demand treatment in a mental hospital. Symptoms of some form of psychoneurosis were found in 34, or 5·7 per cent. of casuals, in several of whom the condition appeared to have developed as a sequel of a war neurosis; the commonest form was a state of anxiety, due in many cases to a failure to secure work. Often the adoption of a life of vagrancy appeared to be a reaction of flight from an unhappy environment. Neurotic cases of the psychasthenic type were not uncommon, but hysteria was rare and found for the most part among the women, usually in association with alcoholism. In view of these findings Dr. Lewis advises a periodic medical examination of all casuals by practitioners with an interest in psychiatry.

PHYSICAL DEFECT.

It was impossible in the course of such an investigation to make an exhaustive search for physical defects, but attention was paid to any symptom of which a casual complained, with the result that 43 cases of circulatory disease, 75 of chronic alcoholism, and 27 of diseases of the respiratory system were found. Other common physical disabilities were hernia, varicose veins, failing vision, malnutrition, and minor deformities such as ankylosed joints and spinal curvature, or due to rickets and war injuries. Osteo-arthritis and skin diseases were surprisingly rare. In the absence of suitable tests it was impossible to determine the incidence of venereal disease. A periodic medical examination would prevent the deterioration of slight disabilities into serious conditions, Dr. Lewis considers, and would extend the working life of casuals for several years.

The age distribution of casuals gave 13·8 per cent. under 30 years, 66·6 per cent. between 30 and 60, and 19·6 per cent. over 60. None of the women casuals was under 30, and only one child, a few weeks old, was present in the wards visited; the total number of children belonging to the group, according to the information received, was 35, of whom 8 were in the charge of relatives and 10 were under the care of the poor-law authorities or charitable organisations; no information could be obtained about the remainder. Marriage appears to be rare among casuals, no less than 80 per cent. declaring themselves to be unmarried. When questioned on their employment, 80 per cent. admitted to being unskilled labourers, 15 per cent. had performed some kind of skilled work, and less than 5 per cent. had held clerical positions.

A casual was classified as "habitual" when he had

[1] Ministry of Health. Cmd. 3640. H.M. Stationery Office. Pp. 99. 1s. 6d. The members of the Committee were Mr. J. A. Dale, Mr. Douglas Hacking, M.P., Sir Arthur Lowry, Dr. A. C. Parsons, Mr. A. Paterson, Rev. L. R. Phelps (chairman), Mr. Arthur Shepherd, M.P., and Mrs. Wintringham, with Mr. L. N. Ure of the Ministry of Health (secretary).

visited casual wards at fairly frequent intervals for a period exceeding one year, and 81·9 per cent. of the total fell into this class; it was estimated that approximately one-third of habituals were not seeking work. Yet whether judged by moral, intellectual, social, or economic standards, Dr. Lewis finds the vagrants of the casual wards better than large numbers of men and women seen from time to time in common lodging-houses, and advises that no innovation be considered which would have the effect of increasing the numbers in such houses, where owing to less adequate public control the vagrant proves a greater menace to the community. He suggests that there should be closer coöperation in the administration of the lodging-houses and the casual wards.

The Committee's Recommendations.

These follow the opinion of Dr. Lewis in the matter of medical examinations; they suggest that these should be made once a month, but on no fixed day, and should include every inmate of the ward at the time. In addition, the officer in charge of the ward should make a practice of bringing to the notice of the doctor any casual who appears to be ill or mentally disordered. Facilities for bathing should be available for every casual on admission, and his clothes should be handed over for storage, so that the need for searching will disappear; disinfection of clothes should only be carried out when necessary and not as a routine. It is advised that the period of detention should always include two nights unless the casual holds a "vacant ticket" issued by a labour exchange, which indicates that he has satisfied the exchange officer that he is seeking work in the district for which he is bound, and that he has a reasonable prospect of obtaining it. Useful and appropriate work should be available for the casual on the day of his detention, and the committee are of the opinion that this could be best provided by appointing a properly trained officer to supervise and instruct. Accommodation in the wards should include a waiting room, a receiving room, day rooms and grounds for exercise, and a separate sleeping cubicle for each casual. Suggestions are offered for improvements in the dietary by the inclusion of 2 oz. of meat in the midday meal, the compulsory addition of some vegetable other than potatoes, and the complete omission of gruel. Registration of casuals is recommended, and the segregation as far as possible of the younger men from the old habituals. Few constructive proposals are offered for reformative measures, but the committee advise closer coöperation between vagrancy committees, employment exchanges, and voluntary bodies willing and able to accept for treatment vagrants who wish to alter their mode of life; moreover, they recommend that local authorities should be allowed, by subscribing to suitable voluntary bodies, to encourage the formation of training centres or to establish such centres themselves. Coöperation could be effected by means of advisory committees representing the vagrancy committee, the standing joint committee or watch committee, the Ministry of Health, the employment exchange, and the interested voluntary bodies in the area. The coöperation of neighbouring councils by means of vagrancy committees is also recommended. It is hoped that, by giving individual attention to each casual, the man who enters the ward for the first time will be given an early opportunity to reinstate himself, while those suffering from some mental or physical disability will be referred to the appropriate institution for treatment; both measures would have the desirable effect of reducing the numbers in the casual wards.

LISTER INSTITUTE OF PREVENTIVE MEDICINE.

(*Continued from p. 1370.*)

Department of Biochemistry.

Ossification.—Dr. R. Robison has continued to collaborate with Dr. Honor B. Fell, Director of the Strangeways Research Laboratory, Cambridge, in the investigation of the development of cartilage and bones of the embryo chick, both in the egg and when isolated and cultivated in vitro. The work has now been extended to the study of membrane bone, for which purpose the jawbone has been found most suitable. Experiments on calcification in vitro have been continued by Dr. Robison, Miss M. Macleod, and Miss A. Rosenheim, and the formation of new deposits in slices of the bones of rachitic rats has been investigated under various conditions. Evidence has been obtained of the existence of two mechanisms favouring calcification in hypertrophic cartilage, the enzyme mechanism producing supersaturation of the solution by increasing the inorganic phosphorus concentration, and a further mechanism favouring deposition of salts from the supersaturated solution thus formed. In order to gain information on the nature of this second mechanism Dr. Robison and Miss M. Maclean are studying the deposition of calcium salts in colloid gels, under conditions similar to those used in the experiments with bone slices.

THE VITAMINS.

Dr. S. S. Zilva has continued his investigation of the spontaneous inactivation of the antiscorbutic factor, and more light has now been thrown on the cause of the modification of the stability in neutral solutions of the vitamin produced by autoclaving active solutions. The investigation instituted to ascertain whether a functional relationship exists between the antiscorbutic factor and any other factor or factors in the apple and in citrus fruits has been extended in several directions. The inquiry into the vitamin content of dairy products as influenced by environment, breed of cow, transit, storage, and other factors has been continued by Dr. Zilva, Miss Crawford, and Miss Perry, and a further number of controlled samples of butter has been assayed. Attempts are being made to improve methods for vitamin assay.

Work on the isolation of vitamin B_2 is being continued by Miss Harriette Chick, D.Sc., and Miss A. Copping. They are endeavouring to prepare concentrations of this vitamin from egg-white, in which it occurs unaccompanied by vitamin B_1, and from mammalian liver.

Miss Chick, Miss M. H. Roscoe, and Miss Copping have made a quantitative study of the heat stability of vitamin B_2 in yeast and yeast extracts and of its sensitiveness to the presence of alkali. Their finding that vitamin B_2 is very sensitive to alkalies at high temperatures is opposed to the conclusions of other workers in this field (Drummond and co-workers; Reader), who consider that vitamin B_2 is stable to the action of alkalies at high temperatures but that yeast contains an additional dietary factor, "vitamin B_3," which is heat and alkali-labile.

Evidence that a third, hitherto unrecognised, dietary factor exists in yeast has been accumulated in the course of the above research, but the evidence points to its being heat-stable. For example, the growth of young rats on "synthetic" diets in which the vitamin B_1 is provided by

Peter's concentrate and the vitamin B_2 by preparations from egg-white, is inferior to that attained when the latter vitamin is furnished by autoclaved yeast products. Further, the repeated failure experienced, in common with other workers, in attempts to breed young from rats reared to maturity upon diets which contain all the recognised necessary B vitamins and other dietary factors also points to the existence of at least one unknown factor which is indispensable for correct nutrition.

Search for this unknown substance is being made among both purified substances and ordinary foodstuffs.

Using the methods of assay with young growing rats worked out in this department, Miss Roscoe has extended the work on distribution to green and root vegetables and has found lettuce, cabbage, and spinach to be valuable sources of vitamin B_2, and much richer in this vitamin than in vitamin B. Dr. Aykroyd (Beit Memorial Research Fellow), at present assisted by Miss Gaffikin, is continuing on a larger scale the previous work on the cereals (wheat, rice, maize, millet and their constituent parts) with the aim of throwing further light on the epidemiology of pellagra. Foods rich in vitamin B_2—viz., meat, milk, eggs, and green vegetables, coincide with those which have been found most effective in practice for the prevention and cure of this disease.

Cereals as a class, however, are poor in this vitamin, but since pellagra occurs almost exclusively among maize eaters and is almost unknown among populations whose staple food is wheat, rice, or millet, the vitamin B_2 content of milled maize should be found appreciably lower than that of the other milled cereals, if lack of vitamin B_2 is to be accepted as the primary cause of the disease. For it is unlikely that the association of pellagra with maize could be accidental and due to deficiencies in other constituents of the maize-eaters' diet. Attention is also being paid to the possibility that some toxic factor may be present in maize.

The cereals above mentioned are also being assayed for their content of vitamin B_1 to see if the results are in accord with the vitamin (B_1) theory of the ætiology of beri-beri. Dr. Aykroyd spent the summer of 1929 in Newfoundland and Labrador for the purpose of investigating food deficiency disease among the population. Beri-beri was found to be fairly common and to affect chiefly the poorest among the fishermen. Clinical observations in Labrador fit well with experimental evidence with regard to beri-beri. Some investigations were also made on functional night-blindness, a condition not uncommon in Newfoundland and often thought to be associated with faulty diet. It occurred among those whose diets were obviously deficient in vitamin A and yielded at once to treatment with vitamin A-containing foods.

Biological Value of Proteins.—Dr. Margaret A. Fixsen, in collaboration with Miss Chick, is investigating the biological value of proteins and the possible rôle played by vitamins B_1 and B_2 respectively, in determining the minimum intake of nitrogen necessary to secure equilibrium. A satisfactory technique has been evolved using the adult rat as experimental animal. The experimental results suggest that both vitamins are required for an economical use of nitrogen. The effect is, however, an indirect one, for absence of either causes a loss of appetite. The diminished calorie intake is apparent in about 48 hours, by the utilisation of some of the animal's own protein to supply fuel. The power of the rat storage of vitamins B_1 and B_2 would appear to be very limited.

Most previous estimations of the biological value of different proteins suffer from the defect that an inadequate supply of B vitamins was provided during the observations, as materials rich in them also contain enough nitrogen to vitiate the experiment. In the method used by Dr. Fixsen the necessary B vitamins are administered as concentrates containing only minimal amounts of nitrogen; it is hoped, therefore, to obtain more trustworthy estimations of the biological values of the proteins contained in the commoner foodstuffs than has hitherto been possible.

Carotene and Vitamin A.—The exact relation of carotene to vitamin A has been, and, to some extent still is, problematical. It is quite clear that when vitamin A is derived from animal sources, such as liver-oils or butter, carotene cannot be responsible for the whole vitamin A activity, for there is no apparent quantitative relation between the vitamin A value and the depth of yellow coloration. In plants, on the other hand, the relation between depth of yellow colour and biological activity seems to hold good throughout.

The fact that vitamin A cannot always be carotene has tended to discount the possibility that it sometimes may be. This fact, coupled with Prof. J. C. Drummond's pronouncement that highly purified carotene has no vitamin A value, had caused the subject to be dropped, although the association of carotene and vitamin A activity in plant organs is so striking that it could hardly be fortuitous.

The problem was attacked again recently by Euler, to whom it appeared possible that omission of vitamin D from the basal diet of the experimental rats might have accounted for Prof. J. C. Drummond's failure to find carotene active as a source of vitamin A. After much work and the examination of samples of Prof. Drummond's carotene, Mrs. Smedley Maclean, D.Sc., Miss M. Hume, Prof. Drummond, and Dr. Euler identified the factor causing the discrepancy, and it is now generally accepted that highly purified carotene has the power to function as vitamin A, though it cannot be affirmed with absolute certainty that the activity is not due to the presence, as an impurity, of the colourless substance which represents vitamin A in liver oils. If this is the case, the impurity, it must be supposed, is always present in a definite quantitative ratio, and defies all ordinary chemical methods of separation.

The behaviour of rats during and after the experimental period of testing for vitamin A suggests that there is still some factor or factors, not included in the diet, which ought to be present for growth and development to be normal when vitamin A is added; the absence of this factor or factors mars any long-term dietary experiment and is constantly under investigation, concurrently with the vitamin A tests.

Department of Experimental Pathology.

RATE OF HEAT-LOSS FROM A SWEATING BODY.

Dr. A. J. Canny (Rockefeller Fellow, Sydney) and Sir Charles Martin have completed their investigations into the laws of cooling of moist bodies.

Evaporative, convective and radiant heat losses have each proved to be accessible to experimental determination. A large number of experiments made under varying conditions of atmospheric temperature and humidity and in winds of different velocity have been made. They have shown that a simple, even if lengthy, formula which includes no term that cannot be justified on physical principles, may be used to predict the rate of loss of heat from a given moist body under any environmental conditions. For this prediction only the wet and dry bulb temperature of the atmosphere, the wind speed and the internal temperature of the cooling body need be known. Several constants must be available to allow of a calculation of heat loss, but these are easily obtained in a simple system by a few experiments. In particular it has been shown how the temperature of the evaporating surface itself can be measured. This is a quantity whose value seems so far to have eluded experimenters in this field.

It is hoped that the principles developed will be of general application though the absolute quantities obtained in this investigation are applicable only to the particular system used.

ENDOCRINOLOGY.

Hormones of the Anterior Pituitary.—Active extracts from the anterior portion of the pituitary gland can be made both by acid and alkaline watery solutions.

Dr. V. Korenchevsky finds, in confirmation of Evans's experiments, that the former stimulate the development of the generative organs and the cortical portion of the adrenals, whereas the latter have the opposite effect. At the same time the nitrogen metabolism of animals is reduced below the normal.

Department of Protozoology.

EFFECT OF GAMMA IRRADIATION ON BODO CAUDATUS.

The knowledge of the cultural conditions of *Bodo caudatus* obtained in the course of her previous work has been used by Dr. M. Robertson in an attempt to test the effect of exposure to radium upon the growth of cultures under various experimental conditions.

Bodo is very resistant to the gamma rays and the actual death of a culture has not so far been achieved by exposure to a combination of radon and radium equal to 175–200 mg. of radium (screened with 0·5 mm. of lead sheeting) at a distance of 1 cm. for five days.

Two types of experiment have been tried. In the first an actively growing culture is divided equally between two hard glass tubes. One of these is exposed to radium; the other is not and serves as the control. From these two tubes, plates are made at various intervals under precisely parallel conditions. The growth on the plates is followed by means of sample films made at intervals; the films are stained and the numbers in division and the various phases of division are counted per thousand individuals. A second type of experiment is now being worked out in which the bodos are cultivated upon plates but in such a manner that the plate sequence—of initial lag and active rise of multiplication which drops gradually to a cessation of division with high absolute numbers and a final dying down to low numbers in an almost quiescent state as regards division—is reduced to a minimum, and the bodos, which are moved daily on to a fresh plate, are kept multiplying continuously at an approximately uniform rate.

This work is being carried out in association with Mr. Bernard W. Williams of the Surgical Unit at St. Thomas's Hospital.

Department for the Study and Preparation of Antitoxic Sera.

Experimental Production of Pneumococcal Endocarditis.—Dr. G. F. Petrie's experiments have now furnished clear evidence that recurring blood losses predispose to the production of valvular lesions in highly immune rabbits which are given repeated intravenous doses of living virulent pneumococci. The experiments, as a whole, throw some light upon the pathogenesis of infective endocarditis in man, for they indicate the risk of an infective valvular lesion lighting up in consequence of the leakage of bacteria (streptococci or pneumococci) into the blood stream from a cryptic focus, especially in a patient who is suffering from a secondary anæmia. An acquired immunity to the infective organism does not necessarily interpose a barrier to the lodgment and proliferation of the cocci upon the endocardium.

Poliomyelitis.—A horse has been successfully immunised by Dr. W. T. J. Morgan by repeated intramuscular inoculations with a filtrate of a potent poliomyelitis virus. The serum has been tested on monkeys by Dr. Fairbrother and found to possess antiviral properties comparable with convalescent sera. During the whole course of the immunisation no definite signs of a reaction in the horse were observed. The different serum proteins have been separated and purified by the methods in general use for the concentration of diphtheria and tetanus antitoxins. The examination of a limited number of such preparations makes it appear that a considerable part of the antiviral substance is in the euglobulin fraction. The reconcentrated pseudoglobulin and the serum albumin are apparently free from the protective substance.

MEDICINE AND THE LAW.

The Duties of a Police Surgeon.

It has lately been necessary to make a public protest against misconceptions as to the duties of a police surgeon. Proceedings had been taken in the Manchester City Police-court against a man charged with having been drunk and disorderly and with having assaulted a tramcar driver. It appeared that when the accused was taken to the police station he asked for a doctor and that a telephone message was thereupon sent to the divisional police surgeon. The surgeon, it was stated, answered that it was no good his coming. Whatever the answer may have been, it seems subsequently to have been twisted into a refusal to attend without a fee. The presiding magistrate commented upon the refusal as a breach of the surgeon's duty to the city and as a denial of justice to the accused. His remarks received considerable publicity in a Manchester evening newspaper that night under such headlines as "Doctor refuses to see man—Bench insist on duty to city—Presiding magistrate's stern comments." Next day the magistrate withdrew his observations not unhandsomely, explaining that he had spoken under a misapprehension and that the police surgeon had been under no obligation whatever to attend in consequence of the telephone message. It was thereupon explained to the magistrate that a police surgeon is not a municipal official. He renders his service under an agreement. The public has no call upon his services. His agreement is that he will attend at the request and on the instruction of the police to make certain examinations and certain reports and, if necessary, to give evidence. Being thus a potential witness for the prosecution, he seems hardly the most appropriate person for an accused person to call in as a prospective witness for the defence. Perhaps in no other country but Britain, where the fairness of quasi-official witnesses for the prosecution is so conspicuous towards the accused, could it be thought that a divisional police surgeon was at the beck and call of every defendant.

The magisterial comments, which otherwise might considerably have damaged a medical practitioner both by charging him with laxity and selfishness in the execution of his duties and by prejudicing his reputation with his patients and friends, were thus satisfactorily withdrawn and the incident ended happily. The misunderstanding as to the police surgeon has its parallels in the popular misconceptions as to the general practitioner. Not infrequently at coroner's inquests and elsewhere a witness complains that a doctor was summoned and callously refused to attend. Many who in their own persons insist upon a rigid limitation of their hours of daily toil, look upon the medical practitioner as an automaton who never eats or sleeps and who never has public or private engagements. A patient can be forgiven for forgetting the claims of other patients. But if a peremptory demand for the immediate attendance of a doctor is put as a matter of legal obligation, it is necessary to say frankly that no such obligation is known to the law. Nobody can compel a firm of solicitors to accept him as a client, much less to attend him and take his instructions at midnight or on Sunday afternoon. Analogy between the legal and medical professions is obviously imperfect owing to the difference in the services which each renders. But, as a matter of contractual relationship, there is no more obligation in the one case than in the other.

BERLIN.

(FROM OUR OWN CORRESPONDENT.)

CHANGE IN THE SICKNESS INSURANCE LAW.

By a presidential order which is valid until the new Reichstag either agrees or disagrees, important alterations to the Sickness Insurance Law have been issued. Under the present bad economic conditions of Germany the sick clubs (Krankenkassen) were said to be unable to work under the old conditions, economy being essential. It was pointed out that members often abuse the help to which they are entitled by approaching the Krankenkasse even for imaginary ailments, by inducing medical men to prescribe medicine, or by reporting themselves unable to work in order to get sick pay. The principal items of the new order are that henceforth a member of a Krankenkasse has to pay 50 pf. (6*d*.) for the voucher which entitles him to consult a medical man; hitherto these vouchers were issued free of charge. He has also to pay the same sum to the pharmacy for every prescription. A Krankenkasse is also empowered to give its members higher sick pay, leaving it to them to consult medical men and to buy medicine at their own expense. The Minister of Labour stated in the Reichstag, where the health insurance was lately discussed, that the expenses for that insurance were much higher in Germany than in any other country. At the last meeting of the Aerztetag, where the order has been much criticised, the fear was expressed that the alterations in the law might result in a diminution of the consultations of medical men even in those cases where medical attendance is absolutely necessary. Still more important is a provision that medical officers are to be appointed to supervise the medical men engaged in insurance practice. Those medical officers will have the right to state whether a patient is to be attended at all or is able to work, or whether the treatment prescribed by a medical man is necessary or too expensive. In this way, it is feared, the freedom of the profession will disappear and medical service will be in charge of a corps of salaried medical officers. The Minister of Labour is, moreover, to have the right of cancelling a contract between a sick club and a medical organisation if the expenses of medical attendance are too high. The number of young doctors to be admitted to insurance practice is to be limited still further. The order is the most controversial measure put forward for many years, since it destroys all that has been done for the common good of the profession and the Krankenkassen. Although it is doubtful whether the new Parliament to be elected on Sept. 14th will pass the whole of the order, or whether it will have to be modified, there is undoubtedly a strong movement towards saving money in social insurance at the cost of the medical profession.

HEREDITY OF TUBERCULOSIS.

Dr. Vershuer lately read a paper before the Berlin Medical Society on his statistical and genealogical researches into the heredity of tuberculosis. Dr. Vershuer has attempted to compare twins produced from one single ovum with those produced from two ova. His material consisted of 75 pairs of twins, of whom 19 were from one ovum; of the other 56 pairs, 38 were of the same sex and 18 of different sexes. At the time of the research tuberculosis was manifest in one or both of the twins in 42 pairs, symptoms of healed tuberculosis were found in 19 pairs, and no symptoms of the disease were present in 14, although the twins came from a tuberculous "milieu." The twins were divided into three groups: (1) those where both showed the same liability to tuberculosis—to this group belonged 25 pairs; (2) those where one had a passing tuberculosis, or where tuberculosis had affected them both, but at quite different periods of life, or where disease was manifest in different organs, or though affecting the same organ, the prognosis was very different; (3) those where one of the twins had already died, while the other was still healthy. In the twins produced from one ovum it was found that tuberculosis of the same intensity became manifest in the same organ, and even if the twins were separated one from the other and lived in different places; while in the two-ova twins of the same group no case was found where the disease had the same characteristics. In the one-ovum twins liability to tuberculosis differed only until the age of 18 years; in the two-ova twins the difference increased with the age without external causes being responsible. In one-ovum twins the liability to tuberculosis and the similarity of symptoms were much greater than in two-ova twins. Dr. Vershuer concludes from his observations that heredity is an important factor in the pathogenesis of the disease.

MEDICAL EXAMINATION OF MOTOR-CAR DRIVERS.

Dr. Franz, of the Institute for Legal Medicine, holds that licensed motor-car drivers should be examined not only before the licence is granted, but periodically. Beginning at the fortieth year of age, such examination should, in his view, be carried out every second year. In this way the beginning of general paralysis, alterations of the blood pressure, or senile phenomena might be ascertained. After every accident the motorist should be examined with special reference to his mental functions. If an accident is suspected to be due to inebriety he suggests that the blood of the driver and his victims should be examined in a medico-legal institute in order to ascertain the quantity of alcohol present.

DEATH OF PROF. FÜRBRINGER.

Prof. Paul Fürbringer, whose rules for prolonging life based on his own experiences were mentioned in these columns last year,[1] has died in Berlin at the age of 81 years. He was for long chief physician to the Friedrichshain Municipal Hospital; he resigned that appointment some years ago but continued in private practice, and was a recognised expert in medico-legal work; the generally adopted method of cleaning the hands before surgical operations by washing them in a mixture of alcohol and sublimate of mercury was based on his bacteriological research, and was first recommended by him. Fürbringer's vitality was enviable; he indulged in walking, swimming, skating, and mountaineering until recently, notwithstanding his advanced age. He was a genial man and much liked by the profession in Berlin.

THE LÜBECK DISASTER.

The number of deaths in Lübeck as a sequel to mistakes committed in the Calmette treatment has reached 62. The judicial prosecution of the physicians of the general and the children's hospital respectively and of the medical director of the Lübeck Health Office is still in progress.

[1] THE LANCET, 1929, i., 844.

BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

INFANT PROTECTION IN HUNGARY.

At the recent meeting of the Budapest Royal Medical Society Dr. Nikolas Pfeiffer spoke of the exceedingly low birth-rate in Hungary in the post-war years, and of the measures whereby the level of population could be maintained. One method was by lengthening the average duration of human life; another method was in the improvement of the living chances of the groups most exposed to the risk of death, such as new-born infants. For the reduction of neonatal mortality, which is high in Hungary, the means suggested are greater antenatal and intranatal care. The insurance of motherhood should be extended, and not only more direct material assistance but a thorough reform of the midwifery service is essential. The organisation for the protection of infant and mother should be expanded to cover the agricultural class, which at present is left out. Among the postnatal schemes the injection of B C G is advocated. A defect in the present organisation is the lack of elasticity. Local schemes should be assisted and supplemented not according to the size of the population but to the rate of infant mortality in the district concerned.

THE RELIABILITY OF CANCER STATISTICS.

According to a lecture given in the Medical Society of Budapest by K. Wolff, the method of preparing cancer statistics should be revised. The only reliable statistics are those founded on diagnoses established in vivo, post-mortem protocols, on histological sections, and, finally, on the data afforded by compulsory death certificates. Unsupported clinical diagnoses of cancer, according to calculations, are erroneous in 20 to 40 per cent. of cases and, therefore, exact statistics cannot be expected without histological controls. The verdicts of coroners, some of whom are not medically qualified, are quite unreliable. Thus statistics which appear to prove the increase of cancer mortality may indicate only the development of the science of medical diagnosis; whereas cancer mortality rises in such statistics, the number of cases labelled senile marasmus, unknown disease, and other indefinite diagnoses decreases. Nowadays all well-trained doctors know that nobody dies solely from senile debility. If the patient had no other disease he would be certain to have had myocardial degeneration or a broncho-pneumonia. Post-mortem statistics are also unreliable, because they do not reflect the conditions of the whole population, but of the hospital class. This objection holds true still more with regard to the statistics based on histological material alone. The fewer the cases utilised in the compilation of cancer statistics, the less reliable are the results. In one hospital the leading surgeon may have a predilection for cancer cases; hence the cancer turnover is high. Another hospital hardly admits cancer patients, because its surgeons work on other lines; the number of cancer cases here will be low. Such sources of errors can be eliminated by the collation of the material of many hospitals, when those which have large children's departments will serve to balance others dealing almost exclusively with cancer cases. Thus a fairly accurate picture of the conditions of population could be obtained, but only of the hospital class. The statistics hitherto published do not prove, in Dr. Wolff's opinion, the assumption that the rate of mortality from cancer shows a rising tendency. A relative rise is the obvious corollary of the fact that the number of deaths from other curable and preventable diseases is diminished. But this means no more than that we are at present unable to defend ourselves against cancer, because we know neither its cause, its therapy, nor its prophylaxis. The average duration of life is increasing steadily all over the world. Cancer is the disease of elderly persons. If the average duration of man's life increases, then there are more elderly persons—that is to say more people reach the age at which cancer is apt to occur. It may well be that the number of cancer cases shows considerable increase with the rise of the average duration of life. In Dr. Wolff's view the apparent increase in the incidence of cancer has been too much emphasised. The mortality-rate of every disease displays some oscillations if we comparatively scrutinise the statistical material available over several years. Wolff protests against the interpretation of what may be only natural oscillations as a progressive rise in incidence.

At the same meeting Dr. Ö. Zalka also expressed the opinion that the mortality statistics of cancer leave much to be desired. According to his observations the error in cases of gastric cancer is 31 per cent., in uterine cancer 7 per cent., in rectal cancer 19 per cent., and in œsophageal cancer 130 per cent. The statistics collected by him show no progressive increase of cancer, its occurrence being fairly constant. For instance, between 1919 and 1923 among the autopsies in the Budapest University Clinics on patients over 20 years of age the cancer rate amounted to 12·42 per cent., while between 1924 and 1928 it amounted to 12·52 per cent. Since in quite recent years a larger proportion of different sections of the population seek relief in hospitals, and are subjected to routine post-mortem examinations, he believes that the data provided by post-mortem statistics to-day are nearer to reality, and more nearly representative of the truth, than the older statistics.

THE NERVOUS AND MENTAL INDICATIONS FOR ARTIFICIAL ABORTION.

Dr. P. Büchler, of the Budapest University, holds the view that artificial abortion is indicated in cases of severe reactive depression, when the patient displays obstinate resistance against taking nourishment, or if she develops suicidal tendencies. Even in these cases institutional treatment must first be tried, and abortion is indicated only if this treatment is not practicable. In an institute resistance to food can be defeated by the application of forcible feeding, and suicide can be prevented by careful watching, but even in institutions the pregnancy may have to be terminated. Most difficult is the problem of schizophrenia. Although it is beyond dispute that the reproduction of schizophrenics is undesirable, our efforts must be directed to the prevention of gestation rather than its interruption. There are no definite general indications in psychiatry, but in psychopathies arising from severe intoxications and infections, and in certain cases of paralysis, interference is justified, and, at any rate, danger to the life of the mother can be avoided. As a rule, when a psychosis is suspected Dr. Büchler recommends the conveyance of the patient to a mental hospital, where the physician in charge can take what action he deems necessary. The sphere of neurological indications is also narrow. Severe cerebral and spinal diseases form absolute indications for abortion. Disseminated sclerosis is an important one, because this disease tends to progress after childbirth; palsies, ataxia of a greater degree, and the quick loss of

strength may follow. This holds true also for locomotor ataxia, inasmuch as after childbirth ataxia increases and bladder and intestinal troubles may supervene. That spinal and cerebral tumours, syringomyelia, progressive spinal muscular atrophies, hereditary chorea, lateral sclerosis, and severe forms of epidemic encephalitis form absolute indications is beyond dispute. In doubtful cases Dr. Büchler holds that social and eugenic considerations may be allowed to influence the decision, but only in minor degree.

UNITED STATES OF AMERICA.

(FROM AN OCCASIONAL CORRESPONDENT.)

EPIDERMOPHYTOSIS.

THIS disease, which is also known by a host of pseudonyms such as "athletic foot" or "swimming-pool itch" is believed by many dermatologists to have taken first rank among skin diseases in this country. It is supposed to have been imported by American soldiers returning from the war. Probably the majority of regular habitués of gymnastic halls are now infected with this distressing parasite. It abounds in schools and colleges and seems to be spread especially in damp places such as shower baths and swimming pools. One measure of prophylaxis that has been suggested is to arrange for bathers to soak the feet in 15 per cent. solution of sodium hyposulphite before putting on their shoes and stockings. The following recommendations have been issued by the New York State Department of Health.

1. Inspection of the feet and toes of all bathers and exclusion of those showing infection. The disease may show around the base of the nails or between the toes as a raw open sore or as small or large blisters, or it may resemble eczema.
2. As the fungus will grow readily on silk and cotton goods, leather and probably on damp wood, all equipment such as benches, stools, diving boards, steps, rubber mats, and floors should be washed daily with a strong solution of chlorinated lime or soda. Canvas mats or pads should be abolished.
3. Prevention of exchange of unsterilised towels, suits, or bathing slippers.

POISONOUS PROPERTIES OF MAPLE SUGAR "SAND."

The New York State Department of Health has recently examined and reported on samples of maple sugar "sand" to the consumption of which the death of two children in the State had been attributed. The children had found an old can containing some of this chalk-like substance, had filled the can with water and drunk the solution. They developed a violent gastro-intestinal inflammation with profuse stools containing blood, marked prostration, and rapid lowering of body temperature before death. The sample of "sand" examined in the State laboratories was obtained by filtration of freshly made maple syrup. It was found to be a complex substance consisting mainly of calcium malate. Since magnesium malate is known to produce severe diarrhœa in adults in doses of 9 g. or more it seems probable that calcium malate was the poison responsible for the children's deaths.

HEALTH WORKERS TO TOUR MEXICO.

The American Public Health Association is to hold its annual meeting this year at Fort Worth, Texas, from Oct. 27th to 30th. At the close of the conference a special tour of Mexico is to be undertaken by invitation of Dr. Rafael Silva, the chief of the Mexican Health Department, with the approval of the President of the Republic who has invited the delegates to visit him in his historic castle. A special train will be at the service of the delegates.

INSANITY AND THE LAW.

The degree of responsibility of a criminal cannot be settled, it is now admitted, either by definitions or by a board of experts; there will always be honest differences of opinion which cannot be subjected to any scientific test. The important matter is not a philosophical conception of free will, but a practical question of the future behaviour of the criminal. Let the jury decide, then, whether or no the prisoner at the bar actually committed the crime. The prisoner is then to be studied by a board of experts with a view to prescribing treatment for the correction of his anti-social behaviour and the protection of society. The following five principles have been adopted both by the American Bar Association and, at its recent meeting, by the House of Delegates of the American Medical Association. 1. That there be available to every criminal and juvenile court a psychiatric service to assist the court in the disposition of offenders. 2. That no criminal be sentenced for any felony in any case in which the judge has any discretion as to the sentence until there be filed as a part of the record a psychiatric report. 3. That there be a psychiatric service available to every penal and correctional institution. 4. That there be a psychiatric report on every prisoner convicted of a felony before he is released. 5. That there be established in each State a complete system of administrative transfer and parole, and that there be no decision for or against any parole or any transfer from one institution to another, without a psychiatric report.

AUSTRALASIA.

(FROM OUR OWN CORRESPONDENT.)

THE PRIMARY FELLOWSHIP EXAMINATION.

THE College of Surgeons of Australasia have officially announced that they have received notice that the College of Surgeons of England will hold a primary Fellowship examination in August, 1931. The examination will be held in Melbourne, presuming that not less than 25 eligible candidates are found desirous of being examined. There is no doubt that all who can will take advantage of this opportunity, but even under the present arrangements distance is still a factor. Melbourne is the most central city for the purpose, but it is still a long way to come from outlying parts. Many have expressed some disappointment that it has not been possible to arrange for the papers to be set concurrently in Adelaide, Melbourne, and Sydney, and for the viva-voce examinations to be held in each city separately. It is understood that this suggestion was made to the Australasian College, and no doubt there were good reasons why it has not been accepted. Nevertheless, such a scheme would give more prospective candidates an opportunity to take the examination.

BROKEN EXPLORATORY NEEDLES.

It was something of a coincidence that the issue of THE LANCET with recommendations about the breakage of hypodermic needles (May 17th, p. 1083) should have arrived in Sydney during the progress of an action, the result of such a mischance. This action was one of more than usual interest, because the doctor had not disclosed to the patient the fact that the needle had been broken. The patient had two brothers who were doctors, and the broken needle was accidentally discovered by X rays. Briefly the facts of the case are as follows. The plaintiff alleged that on Friday, Jan. 30th, 1928, the doctor was performing an exploration of his chest, broke, or allowed to break the needle he was using, but did not

in the after-care of his patient take appropriate steps to guard against the harm which might have been caused by the presence of the needle. The action was attributed to negligence, and it was further alleged that the fact that the doctor concealed the presence of the broken needle from the patient also amounted to malpractice. Subsequently the needle had caused the plaintiff suffering and financial loss. An operation for empyema was performed about an hour after the exploration. The evidence showed that the patient was suffering from bronchiectasis. The defence was an admission of the accident but a denial of negligence. It was stated that the needle had broken off during a fit of coughing whilst the doctor was emptying pus from the syringe. The doctor contended that it is impossible to tell a faulty needle by its appearance, and further that the present condition of the patient was the result of bronchiectasis. Numerous expert witnesses testified that in its present position the needle was doing no harm. The reasons given by the doctor for not telling the patient, X raying him, or attempting to remove the needle, were that in the serious condition of the patient it would have been unwise to have informed him or his wife of the accident, that as he felt certain it was doing no damage he took no further steps in the matter, and further, that operation for removal of the needle would have been harmful.

The jury in their verdict found that negligence had been proved and awarded the plaintiff costs at £100. There is no doubt that the fact of the doctor not disclosing the breaking of the needle weighed heavily against him. A number of questions concerning broken needles arose during this case: the responsibility of the doctor for the use of an unsound needle; the propriety of not telling the patient that the needle had been broken; if the fact is disclosed, when and to whom it should be disclosed in the case of a patient who is seriously ill; the responsibility of the doctor for taking steps necessary for the recovery of the needle or to guard against possible harm caused by its presence.

PUBLIC HEALTH SERVICES

RESULTS OF ARTIFICIAL LIGHT TREATMENT FOR TUBERCULOSIS.

By G. Lissant Cox, M.D. Camb.,
CENTRAL TUBERCULOSIS OFFICER, LANCASHIRE COUNTY COUNCIL.

THE following brief account of treatment by artificial light is based on a report for the year 1929 presented to the Lancashire County Council. Light centres have been established at 12 of the 24 tuberculosis dispensaries in the administrative county. Treatment at each dispensary has in the great majority of cases been given by two carbon-arc lamps (Sunrae pattern) for general treatment, and one Kromayer mercury-vapour lamp for local treatment. For obstinate cases it has been found helpful to resort to ancillary forms of treatment, such as curetting, cauterising, aspiration, or application of ointment.

Summary of Results.

1. Artificial light treatment, undertaken at dispensaries by the tuberculosis officers and tuberculosis health visitors, has continued in 1929 to give satisfactory results, particularly in regard to patients suffering from tuberculosis of the skin and tuberculous adenitis with abscess formation and skin involvement, which conditions are very slow in yielding to other forms of treatment.

2. Of the total patients attending light centres, 77 per cent. were able to continue their normal occupation during the course of treatment.

3. 30 per cent. of the patients treated during the year were assisted by the payment of their railway, 'bus, or tram fares to the dispensary light centres.

4. In regard to the 60 skin cases which became "quiescent and apparently cured," the average duration of the disease before the patients commenced light treatment was 10 years 8 months, whereas the average duration of light treatment was 10½ months.

5. For the 252 cases which became "quiescent and apparently cured," the average duration of the disease before the patients commenced light treatment was 4 years 8 months, whereas the average duration of light treatment was 9 months.

6. The average cost of artificial light treatment at the 12 centres amounted to 4*s*. 6½*d*. per patient per week.

RESULTS OF LIGHT TREATMENT IN 1929.

Form of tuberculosis or part of body affected.	Cases on treatment on Jan. 1st, 1929.	Cases commencing treatment in 1929.	Condition of patients whose treatment concluded in 1929.				Ceased treatment for other reasons.*	Still under treatment at end of 1929.
			Quiescent an apparently cured.	Improved.	Stationary.	Worse.		
Skin (lupus and scrofuloderma)	167	109	60	12	2	1	35	166
Adenitis with abscess formation and skin involvement	87	133	87	6	—	—	21	106
Adenitis without softening	57	99	55	9	3	—	31	58
Bones, joints, and spine	56	41	26	5	5	—	24	37
Abdomen	12	30	13	1	2	1	6	19
Other non-pulm. conditions	17	12	10	1	1	—	4	13
Pulm. tuberc.—								
Lungs—sputum pos.	1	3	—	—	1	—	—	3
sputum neg.	—	2	—	—	—	—	—	2
Bronchial glands	—	4	—	—	—	—	2	2
Pleura	1	1	—	—	—	—	—	2
Pulm. and non-pulm. tuberc. combined	5	5	1	—	—	1	6	2
Total for 1929	403	439	252	34	14	3	129	410
	842							
For comparison, the total in 1928 was	153	573	190	23	10	1	99	403
	726							

* Includes: (1) any patient who did not receive two months' treatment; (2) patients ceasing light treatment prematurely—e.g., removals, unwilling or unable to continue; and (3) patients transferred to sanatoria or hospitals.

7. Of the 252 cases concluding treatment in 1929 on becoming "quiescent and apparently cured," the consultant tuberculosis officers would normally have recommended 211 for treatment at hospitals. Based on the average duration of treatment of such cases, the cost would have been not less than £4792, whereas their treatment at the dispensary light centres actually cost (all inclusive) £2240—a saving of £2552.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

THE following are 1929 statistics of Edinburgh and three English county boroughs:—

Name of district and estimated (R.-G.) mid-year population.	Birth-rate.	Death-rates per 1000 of the population.					Death-rates per 1000 births.		
		All causes.	Tuberculosis.	Cancer.	Respiratory diseases with influenza.	Heart disease.	Infant and neonatal mortality.	Young child (1–5 yr.) mortality.	Maternal mortality from childbirth.
Edinburgh .. (427,538)	17·1	15·1	1·10	1·77	2·6	2·2	80/35	39	7·0
Liverpool .. (872,802)	21·6	15·1	1·46	1·27	4·2	1·3	96/30	74	3·5
Coventry .. (172,000)	14·2	11·5	1·03	1·24	2·7	1·7	73/32	55	4·1
Derby .. .. (140,500)	19·0	13·5	0·87	1·46	2·7	2·7	64/27	34	3·7

Stillbirths per 1000 live births: Edinburgh (notified) 5·6, Liverpool, 4·0, Coventry 4·0, Derby 4·4.

Edinburgh.

Dr. William Robertson's report shows that Edinburgh is tackling energetically a tremendous problem of housing and slum clearance. The houses in the city number 107,704 and include 7233 one-roomed and 32,298 two-roomed dwellings. The municipal houses provided up to the end of the year numbered 5758, of which 866 had two rooms, 4502 three rooms, 252 four rooms, and 138 five rooms. Four slum clearance schemes affecting 2359 houses and a population of 7048 have been completed, including the first section of the St. Leonard's scheme. In 1929 no deaths occurred from measles, although 338 first cases were reported. The outbreak of influenza lasted seven weeks and at the peak caused general death-rates of 32·9 and 29·2 in the first two weeks of February. Since 1898 the cancer death-rate for both sexes has gone up from 0·8 to 1·8. The 76 notifications of enteric fever included a mild outbreak of 30 cases of paratyphoid B with no deaths, which appeared to be associated with the milk from one dairy. The ultimate source of infection could not be traced. Diphtheria was unusually prevalent but the case fatality was much lower in 1928 and 1929 than in previous years. The aspiration method of treatment was tried in a few laryngeal cases and a more extended trial will be made with an electric suction pump. The case fatality of scarlet fever was only 0·3, the lowest ever recorded in the city. Anti-toxic serum was administered in 38·6 per cent. of the 938 patients admitted to hospital. There is need for more hospital accommodation for advanced cases of tuberculosis. The mortality-rate of the 149 puerperal fever cases was 16·7 per cent. Dr. W. T. Benson, resident physician to the isolation hospital, asks for more observation wards for doubtful cases.

The bacteriological examination of the water of the swimming baths confirms the Ministry of Health's (August, 1929) report that all swimming baths should be fitted with a filtration plant, which constantly filters and chlorinates the water. Dr. David Lees notes a marked increase to 54 in the percentage of cases of syphilis presenting themselves at an early stage. He records a decrease in congenital syphilis, attributed to the treatment of the mothers during pregnancy.

Of 17 cases of gonococcal ophthalmia 11 were from Edinburgh and 6 from outside areas; of these latter, 2 cases were sent into hospital at the age of 1 month with one eye already irreparably damaged. As a rule the adulteration of milk is small in degree, but in June 40 gallons of "morning" milk and 30 gallons of "evening" milk were sent into the city by motor from a farm in Lanarkshire. The "morning" milk was 20 per cent. deficient in fat and contained 24 per cent. of added water; the corresponding "evening" milk figures being 14 per cent. and 26 per cent. The defence of the consignor was that the cows had been out on grass of a very poor quality and were not receiving artificial food, whilst in addition a leakage had been detected in the milk cooler. He was convicted and fined £8. During the year 39·4 per cent. of the dairy cows slaughtered at the abattoir were affected with tuberculosis in some degree. The Victoria Hospital tubercle-free herd passed successfully through its two six-monthly tests; and the associated grazing farm in Peeblesshire used for raising young stock has also been kept tubercle-free. The municipal dairy herd kept for the supply of the city hospitals was also maintained in a tubercle-free condition. The percentage of tuberculous milk coming into the city from outside has been lower during the past three years.

Liverpool.

Dr. A. A. Mussen says that the excess of mortality caused by the influenza epidemic chiefly occurred at ages 65 and upwards. Concurrently with the influenza there was an extensive outbreak of measles, and towards the end of the year both scarlet fever and diphtheria became prevalent, taxing the accommodation at the City hospitals. There were 3989 notifications of scarlet fever with 41 deaths—a case fatality of 1·0 per cent. In one school containing about 250 children immunisation was carried out with satisfactory results. The notifications of diphtheria numbered 2336 with 139 deaths, a case fatality of 5·9 per cent. The attack-rate from diphtheria is persistently higher in the outer wards probably owing to the more complete notification of the milder cases. The death-rate is usually highest in the central wards, but in 1929 it was highest in the middle ring, the children having been attacked at an earlier age.

Suicides from gas poisoning showed an increase to 49 compared with an average of 24 for the previous four years. The accidental deaths due to this cause numbered 9. About 65 per cent. of the births are attended by midwives, who coöperate well with the antenatal clinics. There are 28 of these at 15 centres conducted by consultant obstetricians. The new cases which attended during 1929 numbered 11,454 and the total births were 18,888. Dr. Mussen points out that in addition to the 66 maternal deaths, which gave a rate of 3·5, there were 21 other deaths of mothers associated with childbirth, which would bring up the rate to 4·6. The Seamen's V.D. clinic has again demonstrated its value. The new cases of syphilis show a slight decline, the figures for the last three years being 459, 435, and 413; whilst the new gonorrhœa cases show an increase, the figures being 931, 1031, and 1112. Very few gonorrhœa cases come up for treatment at an early stage, and the figures show that 25 per cent. of the syphilis cases appear for treatment in the pre-Wassermann stage, 24 per cent. with primary sore and positive Wassermann, 8 per cent. during the secondary stage, and fully 40 per cent. in the stage of later or latent syphilis.

The bulk samples of city milk examined numbered 327, of which 13, or 3·97 per cent., were tuberculous. Of 197 samples of fresh milk supplied to the city hospitals tubercle bacilli were found in 9, and of 337 samples of milk supplied to maternity and child welfare institutions, 4 were tuberculous. Insanitary houses at the end of the year numbered 1868, 1362 being court houses and 506 front houses contiguous to them.

The want of alternative accommodation in the central area bars rapid progress with improvement schemes, or the enforcement of closing orders. The confirmation by the Ministry of Health of the Queen Anne-street improvement scheme comprising 5¾ acres in the central area was recorded last year but

was quashed in the Court of Appeal. The new municipal dwellings in the suburbs now number 18,201 and 169 flats, and 897 more houses are in progress.

Coventry.

Dr. Arthur Massey submits the report for the last full year's work of Dr. Snell, who retired on Jan. 31st, 1930, after more than 30 years administration of the office. The general death-rate was the highest since the great influenza year of 1918, and although Coventry did not suffer as badly as some districts, there was also a marked rise in infant mortality due mainly to respiratory diseases. The continuance of diphtheria was also a disquieting feature. There were 431 notifications and 37 deaths, a case-fatality of 8·6 per cent. Immunisation was begun and 1171 school-children were protected. If this work is to have an appreciable effect, says Dr. Massey, it will need to be undertaken on a much larger scale than the general parental attitude of to-day permits. The housing problem is made more difficult to solve by the rapid growth of the population. Dr. Massey would like to see use made of Section 3 of the 1925 Act, which gives the corporation power to do the work of reconditioning in the owner's default. Dr. Massey mentions some of the industries of Coventry which reflect the trend of modern life. They include motors, airplanes, artificial silk, electrical industries, printing, watch making, machine-tool making, and general engineering. The town is surrounded by a ring of fine commons and atmospheric pollution is less than in many industrial towns. The small river Sherbourne traverses the city from west to east and is much polluted by refuse. It has to be periodically cleaned. Flooding has been troublesome in low-lying districts and is to be prevented. A new sewage disposal plant by bacteria beds at Finham is in progress. The bacteria beds and activated sludge unit at the old sewage farm will also be retained.

Derby.

Dr. Gordon Lilico submits the report for Dr. Brindley's last year of office, owing to the latter's indisposition. He states that the very young and the very old formed the greater number of the influenza victims. Towards the end of the year scarlet fever became very prevalent and overtaxed the accommodation at the isolation hospital. The report from the V.D. clinic at the Royal Infirmary shows increased attendances. There were 77 notifications of small-pox and one death. The fatal case was a male aged 61, vaccinated in infancy, who died before admission to hospital, the cause of death being certified as "pneumonia, influenza, small-pox." The midwives attend about one-third of the confinements. There is a wide difference in the maternal mortality according as one uses the local or the Registrar General's classification of the deaths. The former allocates 4 deaths to puerperal sepsis and 13 to other accidents, &c., while the latter gives 5 deaths to puerperal sepsis and 5 to other accidents, &c. The maternal mortality is, therefore, either 3·7 or 6·3 per thousand births. Of 54 samples of milk examined for tubercle, seven were found to be infected. In each case the milk came from farms in Derbyshire, and six diseased cows were found and slaughtered. At one farm no diseased cow was found.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED AUGUST 9TH, 1930.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 86 (last week 70); scarlet fever, 1501; diphtheria, 976; enteric fever, 82; pneumonia, 461; puerperal fever, 45; puerperal pyrexia, 120; cerebro-spinal fever, 14; acute poliomyelitis, 15; acute polio-encephalitis, 1; encephalitis lethargica, 12; dysentery, 13; ophthalmia neonatorum, 99. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on August 12th–13th was as follows: Small-pox, 209 under treatment, 2 under observation (last week 218 and 10 respectively); scarlet fever, 1750; diphtheria, 1917; enteric fever, 41; measles, 191; whooping-cough, 78; puerperal fever, 17 (plus 10 babies); encephalitis lethargica, 119; "other diseases," 24. At St. Margaret's Hospital there were 10 babies with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was one death from small-pox, 3 (1) from enteric fever, 14 (8) from measles, 3 (0) from scarlet fever, 11 (1) from whooping-cough, 26 (5) from diphtheria, 45 (5) from diarrhœa and enteritis under two years, and 10 (1) from influenza. The figures in parentheses are those for London itself.

The death provisionally classified to small-pox was assigned to Islington (metropolitan borough); in addition a death belonging to Wallasey (C.B.), which occurred outside that area during the week ended July 26th, is now reported. The deaths from enteric fever outside London were reported from Reading and Grimsby. Three deaths from diphtheria were reported from Liverpool, 2 each from East Ham, Nottingham, and Bradford. Manchester reported 5 deaths from diarrhœa, Liverpool and Tynemouth each 3; West Ham, Warrington, Hull, Gateshead, Rhondda, and Swansea each 2.

The number of stillbirths notified during the week was 288 (corresponding to a rate of 47 per 1000 births), including 55 in London.

REPORTS OF SCHOOL MEDICAL OFFICERS.

—	No. on roll.	Average attend-ance.	Routine inspec-tion.	Special exams. and reinspec-tions.	Percentage of defects.
Derbyshire . .	75,235	—	23,191	8,479	26·1
Hull	47,065	42,212	14,268	51,977	23·1
Warrington .	13,253	11,534	4,178	4,928	15·34

Derbyshire.

Dr. W. M. Ash reports that the work has continued on similar lines to those of the past four or five years, coördination of the various medical services being maintained; the assistant school medical officers are responsible for the child welfare centres in their areas, and the school nurses, with few exceptions, are also the health visitors. The orthopædic scheme has been developed; a full-time orthopædic surgeon now attends each of the ten clinics scattered throughout the county, and the number of children attending them has risen from 920 in 1928 to 1114 in 1929. Bretby Orthopædic Hospital has been extended by the addition of a 50 bed open-air block which was ready for admissions in January, 1930. Dental work shows progress and considerable increase in numbers attending, though there was a small decrease in the number of sessions held, owing to the resignation of one dental officer and the illness of another. It is interesting to note that the number of children made dentally fit (8362) very nearly coincides with the number of school entrants (approximately 8400), which suggests that even with the present staff every child could be made dentally fit at some time in its school life. But following up and re-treatment make necessary an increase of staff which is to be provided in the coming year. A special investigation on orthodontics was made by Mr. M. Lewis, L.D.S., who found that nearly one-third of the children he examined had some irregularity of the teeth. In over half the cases the irregularity was associated with nasal obstruction. Irregularities of the teeth were found to be twice as common in breast-fed as in bottle-fed children. There is apparently a lack of day special schools belonging to the authority. A good number of totally blind and totally deaf children are maintained in suitable schools, but the lack of accommodation for mental

defectives and epileptics in the county is acute, and there is great difficulty in dealing with the cases of combined defect. Two interesting investigations were carried out. Dr. H. S. Bryan examined the general intelligence level of Peak District children, and showed that their average intelligence quotient, calculated on the Stanford Revision, was 99·4—that is to say, the scale is generally applicable to these children. Dr. F. J. Burke investigated lung diseases in school-children, and found that they are often associated with septic tonsils, adenoids, and other morbid conditions of the upper air passages.

Hull.

Dr. W. A. Daley has left Hull to take up a public health appointment in London after only a brief period of office, but the fruits of his organising capacity are to be found in the report to which his successor, Dr. W. M. Frazer, writes an introduction. In the 1927 report the need of myope classes, of an open-air school, of provision of X rays for ringworm, and of an increased dental staff was urged. Now a myope or sight-saving class has been provided whose only fault is that it is not yet large enough; there are open-air classes being held, and an adequate open-air school is under construction. Treatment of ringworm by X rays is working with success, and has just been made available for pre-school children; and this year the dental staff has been again strengthened by the appointment of two more dental officers and a dental attendant. Last year Dr. Daley described his scheme of dividing public health work into four sections: (1) tuberculosis; (2) maternity and child welfare; (3) school medical service; (4) port sanitation and infectious disease. All these services were to be coördinated so that the staff of any division could come to the help of another in case of need, and that the institutions and facilities belonging to each would be at the service of the others. This scheme has now been in operation for some time, and this year lists are given of cases referred from one division to another. Dr. J. Morrison, who is responsible for a large section of the report, writes appreciatively of the coöperation between the school medical department and the general public health department in matters affecting the control of infectious disease in school-children. The coöperation is especially close in relation to the pre-school child, the number of these infants treated at the clinic being over 1000 in addition to 12 cases treated by plaster splints at the Park Avenue Special School. In many other matters improvement is chronicled; a minor example is that of the restriction of casual dental cases. Previous reports gave the reasons for preferring systematic dental treatment and prophylaxis to "last moment" action. This year the number of casual cases has fallen to the very low figure of seven, and experience in 1929 again showed that the public appreciated the fairness of the policy. Only in one respect is this report disappointing. In the report for 1928 it was stated that an orthopædic hospital appeared to be in prospect; this year it is noted that very little progress has been made with the scheme. Special investigations include a scientific study of impetigo in school-children by Dr. Morrison, and an experimental study of the results of the use of tonic medicine in schools by Dr. K. D. Mackintosh.

Warrington.

Dr. G. W. N. Joseph thinks that the relatively low proportion of defects found in Warrington is accounted for partly by the work of the maternity and child welfare committee among pre-school children, and partly by the efforts of the nurses in the schools. A table shows that among the school entrants who had previously attended a welfare centre only 21·5 per cent. were found to have defects, while among the other children the percentage was 31·2. It is clear that much successful treatment is carried out in the schools by the nurses, who also visit the homes and give advice to the parents on home treatment. The system of doing dressings in the schools has caused a great reduction in the loss of attendance due to minor ailments. A special inquiry showed that loss of attendance due to infectious disease is another important factor, but not the principal influence, since in 1922–23, when 128,347 attendances were lost owing to an epidemic of measles and mumps, the percentage of attendances was 91·5, an exceptionally high figure. This year the total loss of attendances through minor ailments and infectious disease together was 100,000, while 200,000 attendances were lost through disease for which certificates from private doctors were produced by the parents, the amount of loss through this last cause having markedly increased since 1921. Dr. Joseph believes that there is here a fruitful field of inquiry which will be made in the course of this year. At Warrington no open-air school, nursery school, or special school of any kind exists, and at present no system for provision of meals is operating. In two schools an excellent plan for the giving of milk, made possible by the self-sacrifice of the teachers, is producing good results, but other schools have not found it possible to adopt the scheme, owing to lack of staff.

Rutland.

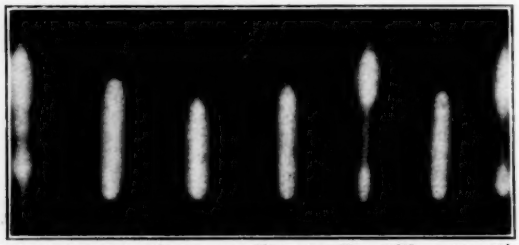
Dr. C. Rolleston, who is in charge of the smallest county in England, issues merely a brief typewritten report which does not reproduce the figures and statistical tables furnished to the Board of Education. In spite of the small numbers of children concerned, the facilities for treatment seem to be reasonably adequate in Rutland and to be well appreciated by the parents. The orthopædic scheme is much in favour; there was only one refusal of treatment. The operative treatment of tonsils and adenoids at the Oakham War Memorial Hospital is of high standard; 90 children have received attention by Dr. F. H. Wallace, but 121 still require treatment. The interest of the parents is illustrated by the large proportion (82 per cent.) attending the medical inspection of their children. This attitude is a great change from that of a few years ago, when the parents viewed the medical services provided with distrust and dislike. Even to-day, Dr. Rolleston says, a few exceptions remain. A mother refused to obtain treatment for her boy's vision, though it was only one third of normal; when she could hold out no longer against persuasion and pressure, including a warning from the N.S.P.C.C., glasses were obtained, but the mother then made a further stand. She realised she could be compelled to get treatment for her boy, but she protested that no law could compel her to force him to wear the glasses prescribed. Dental work has been hindered by a change of dentist, the post being left vacant through illness for two months last year. Improvement on the conservative lines suggested by the Board of Education has, however, begun, the number of permanent teeth extracted having fallen; there have also been many more fillings of temporary teeth, since the present dentist, Mr. L. A. McTaggart, does not favour the extraction of these teeth. The system of a travelling van is proving satisfactory, but the work needs acceleration. If the dentist cannot visit each school every year, children may be left without dental care for so long that some teeth may become unsaveable in the interval. The appointment of a skilled dental attendant or nurse would speed up the work, and it is clear that such an appointment should be made without delay. The duties of the school nurse include assisting in splint and plaster work at the Peterborough orthopædic clinic and giving lectures to elder girls on the hygiene of infancy. Several inquiries were made in the course of the routine work, notably about the proportion of children who had been breast fed, who were vaccinated, who had had symptoms of rheumatism, or who were working out of school hours. The numbers concerned are small, and no general conclusions could be drawn from them. Dr. Rolleston also carried out a special investigation of an acute epidemic at Morcott, which was presumably poliomyelitis with some special features.

CORRESPONDENCE

INEQUALITIES IN RADIUM TUBES.

To the Editor of THE LANCET.

SIR,—In this clinic we have read with great interest the article on Distribution of Radiation from Clinical Radium Tubes by Prof. S. Russ and Miss D. F. Clephan (THE LANCET, August 9th, p. 286). Our physicist, Mr. Hubert Lawrie, has been engaged in taking autophotographs of our needles during the last six months and we have been very perturbed on finding that the distribution, as shown in the photographs, is almost invariably uneven. The active material is usually found concentrated towards the



Autophotograph of seven radium needles with consecutive numbers, each containing 3 mg. element. The needles are 6 cm. long (5 cm. active length), 2·2 mm. external diameter, walls 0·6 mm. thick. Exposure 300 secs. The needle-points are directed upwards.

eye end and must obviously, as Prof. Russ says, militate against uniform irradiation since the action will be concentrated towards the surface in most interstitial applications.

The problem, therefore, that we are faced with is how to get this defective filling corrected. We have already tried tapping and shaking but without any effect so apparently the only solution is refilling. As there must be other clinics possessing similar unevenly filled needles it would be advantageous to all concerned to go into the matter on the lines suggested by Prof. Russ so that, if necessary, combined action could be taken to have defective filling remedied. The appended autophotograph of seven consecutively numbered needles confirms the statement made by Prof. Russ.—I am, Sir, yours faithfully,

JOHN H. WATSON, M.B., B.S., F.R.C.S.,
Director, Radium Clinic, Victoria Hospital,
August 14th, 1930. Burnley, Lancs.

COLOUR-VISION AND COLOUR-BLINDNESS.

To the Editor of THE LANCET.

SIR,—Colour-blindness seems to be occupying great attention at the present time. Two very important communications on the subject have appeared this year. The first a book by Prof. Henschen of Stockholm, on "Lichtsinn und Farbensinnzellen im Gehirn." Prof. Henschen claims that he has proved that there are distinct cells in the visual centre for the perception of light and colour, thus supporting my theory which he quotes.

The second is an article by Dr. William Christie, medical inspector of schools, which appeared in the *Medical Journal of Australia* for Feb. 22nd. Dr. Christie's remarks are based on the examination and re-examination of 20,000 school-children, and he used my classification, those examined being grouped according to the number of colours seen in the spectrum. He states, "One great advantage of Edridge-Green's system of classifying colour-blindness is that it enables us to foretell what colours will be selected to match another colour when once the spectrum of that boy has been obtained." Dr. Christie has made the surprising discovery that on re-examination there is a definite change in the degree of colour-blindness. About 25 per cent. of all persons improve. The same number get worse and the remainder are approximately stationary. Some improved to such an extent that Dr. Christie no longer regarded them as colour-blind.

I am, Sir, yours faithfully,
F. W. EDRIDGE-GREEN.

Board of Trade, August 14th, 1930.

TREATMENT OF PULMONARY TUBERCULOSIS IN SWITZERLAND.

To the Editor of THE LANCET.

SIR,—If the members of our profession will consider the reflections of Dr. Harrison carefully, these will influence the lives of a larger number of individuals in these islands than any other matter recently published in your journal. This statement may appear somewhat dogmatic but the widespread prevalence of tuberculosis gives it emphatic support. His article had a very special appeal to me because here, 1000 feet above sea-level, our winters are very severe, wet, and prolonged. We endure more than our fair share of snow, rain, and mountain mist, and reckon on a month more of actual winter weather than our neighbours at lower levels. We also suffer from lack of sunlight, and for many years I have seen, in the early months of the year, many fresh cases of pulmonary disease. Why should I send these unfortunates from this height to other heights in a colder land, far from their relatives and home interests? I admit this would reduce the number of "contacts" in this country.

Our practice has always been to send cases to our home sanatoria, our southern coast line and the Channel Islands, and our results have been most encouraging. It is a pleasure to see well-marked cases with pallor and tachycardia, irritating cough, and increased root shadow, whom we know to be contacts, return to us full of life and vigour. It is sad to watch the downward trend of cases unable to afford the two or three months treatment necessary. We have many excellent sanatoria, and it is unfortunate that they do not admit all early cases. At the same time we confess that the early cases are not very infective. Probably for those who can afford it residence on the high veldt of South Africa is the ideal treatment; but they should stay there. These cases relapse easily on return to this country.

I have just read Dr. Amrein's letter. It is remarkable how widespread his idea of our climate is on the continent. It is fortunate that our webbed toes and very sensitive touch corpuscles enable us to get about our business with such rapidity in this land of perpetual wet and gloom.

I am, Sir, yours faithfully,
R. S. MCCLELLAND.

Dowlais, South Wales, August 15th, 1930.

To the Editor of THE LANCET.

SIR,—I have read with interest the correspondence in your columns on this subject and I should like

to take this opportunity to correct the impression which Dr. Harrison's article may have made. My remarks must be based on the only treatment centre in Switzerland of which I have personal knowledge.

(1) *Situation.*—This centre has the great advantage of being situated on a plateau and enjoys a superb view up and down the Rhone Valley, of which the eye never tires. In contradistinction to the effect of "unhappy constriction," to which Dr. Harrison refers in writing of the Swiss landscape, a sense of open spaces prevails. Facilities for walking are, I believe, better than in any other Swiss resort; it is possible to walk for an hour or so on the level in more than one direction. With regard to winter sports, Montana since the war has ceased to count as a "sports centre" and has been given up almost entirely to the treatment of tuberculosis.

(2) *Climate.*—No one would deny that the dry Swiss air is beneficial in cases of pulmonary tuberculosis, nor the advantages of the increased appetite induced. Owing to its open position facing south, Montana receives the maximum amount of sunshine. The psychological effect of the sun cannot be overestimated, and however strongly Dr. Harrison may hold a brief for our English climate the average winter day in England or Scotland affords little cheer to the patient in bed and no encouragement to those wishing to pursue "outdoor Nature study."

(3) *Sanatoria.*—Here lies the crux of the matter. It is obvious from the letters in your columns and from my own observations that the administration of many Swiss-run sanatoria is defective, especially with regard to nursing facilities, and that in some instances medical treatment differs considerably from that carried out in our own sanatoria. The ideal would seem to be a sanatorium in Switzerland equipped entirely by a British medical and nursing staff. Such a sanatorium is now nearing completion in Montana.

I am, Sir, yours faithfully,

London, W., August 17th, 1930. DOUGLAS MCALPINE.

UMBILICAL HERNIA IN INFANTS.

To the Editor of THE LANCET.

SIR,—I think Dr. Eric Pritchard misses the point of Mr. Wakeley's remarks on infant feeding. Mr. Wakeley does not say "artificially-fed infants"; but "infants brought up from birth on patent foods"—a very different thing. A baby fed on properly diluted cow's milk does not suffer from indigestion or constipation, but an infant brought up on patent foods almost invariably does, and these, I gather, are the cases to which Mr. Wakeley refers.

I am, Sir, yours faithfully,

J. HAMILTON HART.

Worcester Park, Surrey, August 15th, 1930.

FIRE PRECAUTIONS IN NURSING HOMES.

To the Editor of THE LANCET.

SIR,—More than half of my time during the past ten years has been spent as a patient in nursing homes in London and seaside towns, so that I may claim to be something of an authority on these institutions. I have already observed good results from the new system of registration and inspections. There is one point, however, which well might receive the attention of authority—that is, the arrangements, or lack of such, for removing those patients who are unable to walk, in case of fire. In only two of half a dozen otherwise well-conducted establishments which I have lived in and others I have visited in choosing a place have I felt satisfied that there was any plan or understanding on which the staff would work in getting out patients after the start of a serious fire, particularly at night. It has been my experience that if a patient asks questions about the subject (particularly if he wants specific and detailed information) he is likely to get vague assurances that everything will be all right.

I have been a patient in three homes in which the control was entirely in the hands of a matron, and in two where there was no male member of the staff and no man on the premises at night, and where no apparatus for dealing with a sudden fire was visible. Only a small proportion of the nursing homes I know were built for their purpose. Most of them were originally dwelling houses and have been more or less remodelled for their present use. One of the best (in other respects) London homes I have been in as patient was a tall narrow house with very narrow halls and stairways. Getting a patient who must be carried out of doors from the third or fourth floor, as I know by experience, was a very slow and clumsy proceeding. What would happen if it became necessary to get several out quickly? The choice of a nursing home is made by most people on the recommendation of their doctors. Whether the average doctor feels that responsibility rests upon him to make sure that the place he proposes is efficiently organised in regard to such matters as are outside of his professional sphere I cannot say.

It seems to me that the establishment of regulations or standards regarding fire precautions and insistence that they are observed would be a most desirable reform. It is one that should be dealt with in advance rather than as the result of a coroner's inquest.

I am, Sir, your faithfully,

August 16th, 1930. PATIENT.

DRAINS.

To the Editor of THE LANCET.

SIR,—The leading article in your last issue on drains might lead one to suppose that drainage was of no importance as a cause of epidemic diseases. Are we to believe that a reversion to the state of affairs that existed in this country a hundred years ago would not be associated with a recurrence of the epidemics which, as you point out, were probably brought under control by the attention subsequently paid to all forms of sanitation, including drainage? In the *Times* of July 25th it was reported that typhoid is occurring in such volume at Leningrad at the present time as to cause serious concern, and the impression is conveyed that part of the cause may be the primitive system of cleansing and sanitation generally in that city. Scepticism, no doubt well justified, as to the connexion between drains and many of the infections should not lead us to discount the very great importance of sanitation, including drainage, in the prevention of at least some of them.

I am, Sir, yours faithfully,

August 18th, 1930. M.B.

*** We agree with "M.B.'s" general argument. We were careful to emphasise that there was a genuine case for the urge toward drainage and sewage disposal in the second quarter of last century, and that adequate drainage arrangements must be maintained on general principles. The important point, however, is to secure differentiation both in the medical and lay mind between those diseases which may be

attributable to faults of drainage and those which may not Briefly, it may be said that a community which allows its water-supply to become contaminated by its drains, or permits flies to have access to its sewage in the crude state by failing to provide drains, is taking the risk of epidemics of the alimentary infections, such as typhoid, dysentery, cholera, and infantile diarrhœa; but that the diseases which are conveyed mostly through the air by droplet infection, such as diphtheria, scarlet fever, measles, influenza, and so on, are not likely to be affected one way or the other. Historically there is no evidence that these latter have diminished in incidence during the era of modern sanitation.—ED. L.

OBITUARY

JOHN ELDER MACILWAINE, B.Sc. Glasg., M.D. R.U.I., D.P.H.

THE sudden death on August 6th of Prof. J. E. MacIlwaine, at the comparatively early age of 56 years, has deprived the Belfast Medical School of one of its most distinguished and most scientific physicians.

John Elder MacIlwaine was born in Belfast in 1874, the son of John H. MacIlwaine, a well-known naval architect and engineer, and one of the pioneers of Belfast shipbuilding. It was natural that after his education at the Royal Academical Institution, Belfast, he should first of all enter his father's shipyard, and there serve his apprenticeship. He then went to Glasgow, where he took a University degree in naval architecture, but after his return to Belfast he abandoned this career for medicine. He had a brilliant career at Queen's University, then Queen's College, Belfast, where he was uniformly first in his examinations. Tall and strong, with a good turn of speed, he distinguished himself equally on the football field, and as a forward he had the honour of representing Ireland during three years in her palmy days of the nineties. A popular student, he took his part in the college life, his unusually sweet and vibrant voice being appreciated by his fellow students. While studying in Dublin during his final year the South African war broke out, and he promptly joined the Irish Hospital as a dresser. His work in South Africa was mostly medical, and he always spoke in the highest terms of his chief, the late Dr. J. B. Coleman, of Dublin.

On his return home MacIlwaine took the M.B. degree of the Royal University of Ireland with first-class honours, and then went to the continent for a prolonged period of study—Berlin, Vienna, where he spent almost a year, and then Paris. He then came home and served for a year as resident in the Royal Victoria Hospital, Belfast. After he had set up in practice he was connected with the hospital, first as medical registrar and medical tutor, and in 1911, on the death of Dr. W. B. McQuitty, he became assistant physician. He was always interested in diseases of the heart, and it was after seeing the work of Sir James Mackenzie at the London Hospital that he established an electrocardiographic department at Belfast in 1913 for which his early training in mechanics and engineering had so well fitted him. Having served many years as full physician to the Victoria Hospital, in 1929 he was appointed to a specially created post of physician in charge of the cardiographic department. During the great war he joined the staff of the St. John Ambulance Brigade Hospital at Étaples, taking out his own cardiograph with him, and his work done there on D.A.H. cases soon drew the attention of the medical authorities to its value.

After the war the chair of materia medica and therapeutics at Queen's University becoming vacant on the resignation of Sir William Whitla, Dr. MacIlwaine was elected and filled the post until 1928. How much labour he expended on the preparation of his lectures and their revision year after year and what the strain of teaching a subject alien to his personal interests is known only to his intimate friends. Gradually he restricted his consulting practice to cardiac work, and he was one of the founders of the Cardiac Club in connexion with the Association of Physicians of Great Britain and Ireland. His medical colleagues recognised his worth by electing him President of the Ulster Medical Society and President of the North of Ireland Branch of the British Medical Association.

About five years ago Dr. MacIlwaine lost the sight of one eye from detachment of the retina and his general health began to fail. He resigned the chair in 1928 but not before he had persuaded the medical faculty of the University to adopt his scheme, laboriously and carefully worked out, for converting his chair into one of pharmacology with a trained full-time professor of pharmacology at its head. He lived to see that department grow and develop under Prof. E. B. C. Mayrs, new laboratories furnished, and a connexion established with the Royal Victoria Hospital. In October, 1929, symptoms pointing to detachment of the retina in his sound eye appeared. A visit to Switzerland for the most recent treatment resulted in disappointment, and he bravely faced blindness and the whole readjustment of his life. For some months before his death he was studying the Braille system and hoped to be able to adapt it to the reading of his large collection of electro-cardiograms, and thus pass some of his enforced leisure by giving of his wide experience to medical literature.

A colleague, on whose knowledge we have already largely drawn, writes: "MacIlwaine excelled as a clinical teacher, and drew a large crowd of students who were attracted by his lucidity and the practical nature of his bedside teaching. He keenly enjoyed lecturing on his own speciality, and his early training in engineering enabled him to draw many illustrations from mechanics which helped the student in his understanding of the heart and circulation. He always urged the great necessity of ordinary methods of clinical observation before making use of instrumental ones. In one of his last conversations with the writer he voiced the fear that the public were beginning to place an undue importance on the electrocardiograph, and hoped that medical men would not allow themselves to be forced to use it in cases of cardiac disease where its employment was quite unnecessary. His friends regretted that he did not write more on his special subject, but his modesty made him hypercritical of the importance of his own work, and so the fruit of his wide experience and patient investigation is left ungathered. He inspired valuable research in his wards and was ever anxious to assist in every way the younger medical man. His life and work, quiet and unobtrusive, conscientious and thorough, was an example to every medical student of what is best in the art of medicine."

CHARLES BROOK, J.P., F.R.C.S. Eng.,

LIEUT.-COL., R.A.M.C. (T.).

Mr. Charles Brook, who died at Lincoln on August 10th, was a son of the late Dr. W. H. Brook, of Lincoln, where he was born on Feb. 19th, 1839. After a year's pupillage at the Lincoln County Hospital he entered St. Bartholomew's Hospital, London, in October, 1858, the same year as Alfred Willett, John Langton Morrent Baker, and Howard Marsh, the first three of whom were his fellow house surgeons, whilst the latter, after the custom of that time, purchased the remainder of the house surgeoncy to Mr. Skey, which Charles Brook resigned owing to the illness of his father, calling him to Lincoln. During his student days he gained every scholarship and prize that he competed for; Sir James Paget tried to persuade him to remain in London as his assistant, and the treasurer and almoners added their assurance of an early post on the surgical staff if he would so remain. But Brook felt it his duty to carry on his father's practice in Lincoln, which he joined in 1862.

He was elected surgeon to the Lincoln County Hospital in 1864, consulting surgeon in 1900, and vice-president in 1921. In 1862 he was appointed surgeon to the Royal North Lincoln Militia, from which he resigned in 1891, but on the formation of the Territorial Force in 1908, at the request of Sir Alfred Keogh he organised the Fourth Northern General Hospital. Here, during the war, he took the principal surgical part from 1914 to 1918, when, whilst still active in mind and body, he was retired, at the age of 79, by reason of the age-limit. In 1922 the Royal College of Surgeons elected him a Fellow. A fine operator in his earlier days, Mr. Brook was during the whole of his career distinguished for his clinical acumen, power of diagnosis, and shrewdness in treatment, so that his advice was sought after over a wide area. He was a fine sportman, a cricketer from his earliest days, a keen follower of hounds, a fine shot, and able to tramp over the heather until approaching 80 years of age. He was chairman of the Lincoln Race Committee, and at one time raced under the name of Mr. Seabrooke.

A man of sound business ability, Colonel Brook was on the boards of some of the principal business concerns in Lincoln, being chairman of the Lincoln and Lindsey Bank (now merged in the Midland) and of the Midland Counties Insurance Company (now merged in the Royal). He was made a J.P. in 1888. He leaves a son and a daughter, his wife and an elder son having pre-deceased him.

PROF. AXENFELD.

Dr. Theodor Axenfeld, who died at the age of 63 years at Freiburg i. Br. on July 29th, had held the University chair of ophthalmology for almost 30 years. He was born at Smyrna, graduated at Marburg, and was assistant to Uhthoff at Breslau before his appointment at the age of 30 to the chair of ophthalmology at Rostock, which he exchanged for that of Freiburg four years later. Axenfeld's name is associated the world over with the pathology of ophthalmic disease, and especially with that of spring catarrh, trachoma, and sympathetic ophthalmia. His *Lehrbuch der Augenheilkunde* ran through seven editions and from 1904 on he edited the *Klinische Monatsblätter für Augenheilkunde*. His international standing made it possible for him to resume his place in 1929 at the Amsterdam congress, and early this year he had made a tour in Japan where he was received with marked respect. Three of his pupils occupy the chairs of ophthalmology at Cologne, Münster, and Tübingen.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. B. S. Robson is placed on the Retd. List with the rank of Surg. Capt.

Surg. Lt. D. M. Beaton to be Surg. Lt.-Comdr.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Sub-Lt. J. F. Corr to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Capts. E. J. S. Bonnett and F. K. Escritt to be Majs. (prov.).

TERRITORIAL ARMY.

Maj. T. W. S. Hills, having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

Capt. A. B. Williamson to be Capt.

2nd Lt. J. K. Reid to be Lt.

Godfrey Morgan to be Lt.

ROYAL AIR FORCE.

J. F. S. Wiseman is granted a short service commission as a Flying Officer for three years on the Active List.

Squadron Leader T. K. Place (Major, Army Dental Corps) relinquishes his temporary commission on ceasing to be employed with the R.A.F.

RESERVE OF AIR FORCE OFFICERS.

Flight Lt. J. Prendergast relinquishes his commission on completion of service.

INDIAN MEDICAL SERVICE.

Capt. T. H. Thomas to be Maj.

Capt. (prov.) K. F. Alford is confirmed in his rank.

Col. L. J. M. Deas retires.

Lt. H. S. Bawa relinquishes his temp. commn.

DEATHS IN THE SERVICES.

Colonel John Southey Bostock, R.A.M.C., C.B.E., who died suddenly at Burford Priory, Oxford, on August 12th, aged 55, was Commandant of the Royal Army Medical College at Millbank. The eldest son of Dr. E. I. Bostock, of Horsham, Sussex, he received his early education at Lancing College, and graduated in medicine and surgery at Edinburgh in 1900. In the following year he joined the Royal Army Medical Corps as lieutenant, became captain in 1904, and major in 1912. He served throughout the great war both at home and abroad, and was in the retreat at Mons. On his return to England he took charge of the War Hospital at Eastbourne, and was director of medical services at the Ministry of Pensions from 1919 to 1923, when he was made C.B.E., and became Lieut.-Colonel, having been promoted to Brevet Major in 1915 and Brevet Colonel in 1918. Subsequently he was appointed principal medical officer at Hong-Kong, and in the early part of this year took up his appointment as Commandant at Millbank. He married in 1909 Olivia Emslie, daughter of Mr. Emslie J. Horniman, by whom he had two sons and one daughter.

CITY OF LONDON MATERNITY HOSPITAL.—The 179th annual report records that last year 1724 in-patients were treated at a cost of £7 17*s.* 6*d.* each for an average stay of 13·45 days, a reduction of 12*s.* 5*d.* on the preceding year. Of the in-patients seven died, two of whom were emergency cases; the mortality-rate for booked cases was 3·22 per 1000. There were 37 pairs of twins, and 72 stillborn cases. There were 251 out-patients delivered, and 256 children were born outside the hospital. In ante-natal and postnatal work 2070 patients were attended. In the infant welfare centre 431 mothers made 4629 attendances. Nineteen medical practitioners and students attended the practice in the hospital, and 40 midwives and six maternity nurses were in training during the year. The report emphasises the extreme urgency of rebuilding the nurses' quarters—the present lack of accommodation threatens the efficiency of the hospital.

MEDICAL NEWS

Mental Treatment Act, 1930: Approved Medical Practitioners.

The Board of Control, with the approval of the Minister of Health, have appointed a committee "to consider and advise what principles should be observed in the approval by the Board of Control of medical practitioners for the purposes of Sections 1 (3) and 5 (3) of the Mental Treatment Act." The committee is constituted as follows:—Sir John Rose Bradford (President of the Royal College of Physicians), who will act as chairman; Sir Hubert Bond (Commissioner of the Board of Control), Dr. R. G. Gordon (representing the B.M.A.), Dr. G. W. B. James (Royal Society of Medicine), Dr. A. Rotherham (Commissioner of the Board of Control), Prof. J. S. B. Stopford (General Medical Council), Dr. R. Worth (Royal Medico-Psychological Association), with Mr. H. C. Bleakley, of the Board of Control, as secretary. Under Section 1 (3) of the Act the application of the parents or guardian of any person under 16 for his admission to an institution for mental treatment as a voluntary patient must be accompanied by a recommendation from the usual medical attendant, or from a medical practitioner who has been approved for the purpose of making such a recommendation. Section 5 (3) refers to the medical recommendation which must accompany the application of relatives of a patient who is for the time being incapable of expressing himself as willing or unwilling to receive treatment for mental illness, but is likely to benefit by temporary treatment. This recommendation must be signed by two registered medical practitioners, of whom one must be approved by the Board of Control for the purpose of making recommendations under this section.

St. Thomas's Hospital.

The old students' dinner will take place at St. Thomas's House, Lambeth Palace-road, London S.E., on Oct. 3rd, at 7.30 for 8 P.M. The chair will be taken by Dr. R. Muzio Williams.

The following scholarships have been awarded for 1930. University Scholarship: H. F. Moseley, Merton College, Oxford. Hector Mackenzie Exhibition: I. H. Gosset, Magdalen College, Oxford. Entrance Scholarship in Arts: R. R. McSwiney and A. J. Belsey. Entrance Scholarships in Science: First, G. W. Hearn; second, W. E. Hadden and J. I. Lesh. William Tite Scholarship: L. E. Jones.

Chartered Society of Massage and Medical Gymnastics.

The second annual dinner of this society will be held at the Midland Hotel, Manchester, on Friday, Oct. 3rd, at 7.30 P.M.

Medical Society of Individual Psychology.

This society, which aims at bringing together those who are particularly interested in the medical aspects, both theoretical and practical, of individual psychology, will in future meet at the rooms of the Medical Society of London, Chandos-street, W.

Modern Churchmen's Conference.

Among the papers read at this conference, which was held this week at Oxford, the Dean of St. Paul's presiding, were Principles of Sexual Conduct, by Dr. Douglas White; the Influence of Birth Control on Individual and Racial Health, by Mr. C. J. Bond, F.R.C.S., and Eugenics and Population, by Prof. F. A. E. Crew.

People's League of Health.

The 1930 Travelling Scholarship in connexion with the annual series of Sims Woodhead Memorial Educational Health Lectures given by the People's League of Health was won by Mr. A. Hounslow, a first-year medical student of University College, London. Mr. Hounslow will visit the Pasteur Institute in Paris and Dr. Rollier's clinics at Leysin.

Paddington Medical Society.

At the usual monthly meeting, held in the Great Western Hotel on August 12th, the President, Dr. De Swietochowski being in the chair, an address was delivered by Dr. A. Welply, secretary of the Medical Practitioners' Union, entitled "Past, Present, and Future of Medical Practice," in which he described the changes which had taken place within the last 20 years and the various factors which affect the work and position of the practitioner to-day.

University College Hospital.

Last year this hospital treated 8374 in-patients, whose average stay was 21 days; they cost £10 9*s.* 7*d.* each. There were 77,129 new out-patients whose cost was 5*s.* 4*d.* per head. The income—£113,929—exceeded expenditure by more than £10,000.

Manchester Royal Infirmary Old Residents' Club.

The triennial dinner will be held on Oct. 25th. Any former residents who have not received notices are asked to communicate with the secretary of the club at the Royal Infirmary, Manchester.

Hospitals as Companies.

The Liverpool Hospital for Consumption and Diseases of the Chest has been registered as a company limited by guarantee. The Royal South London Ophthalmic Hospital has been similarly registered.

High Wycombe War Memorial Hospital.

This hospital is to be enlarged by the addition of 23 beds, bringing up the total number to 55, and a children's ward is to be provided.

St. Mark's Hospital.

The annual report of St. Mark's Hospital for Cancer, Fistula, and Kindred Diseases, City-road, states that last year there were 806 in-patients and 1804 new out-patients. Miss Florence Clarke gave £1200 for radium, of which excellent use has been made, and the results of the treatment are receiving intensive study.

Enlargement of Croydon Hospital.

Two wards are to be extended to accommodate 44 additional beds, and provision is also to be made for 17 "pay beds." Three houses at the rear of the hospital are to be reconstructed as the Charles Heath Clark Memorial Nurses' Home with a grant from Mr. Clark's executors.

Torbay Hospital Chapel.

A memorial chapel, which has been added to this hospital at the cost of Mrs. Rowcroft, was dedicated last week by the Bishop of Exeter.

Sidmouth Cottage Hospital.

Last week the foundations of an extension of this hospital were laid by Mrs. Balfour, wife of Colonel Balfour, who gave the site of the present building. The population of Sidmouth has doubled since the hospital was enlarged in 1916, and the number of beds is now being increased from 14 to 29 at a cost of £14,000.

Carlisle as a Medical Centre.

Lord Howard of Penrith recently opened two new wards of the Cumberland Infirmary at Carlisle. The Balfour Paul Ward, which commemorates the late Mr. C. Balfour Paul, hon. surgeon to the infirmary, and cost £1600, was given by members of his family; the Woodside Ward, which cost £5000, is the gift of Mr. Andrew Gibson. These additions, with a pathological department, nearly complete an extension scheme costing £55,000, the whole of which has been provided. In a speech at the opening ceremony Dr. Norman Maclaren said that although money was difficult to get, he hoped that the Cumberland Infirmary would presently be able to form a training centre. The hospital already has a successful nursing school, and he had met nurses trained there in India and on the Western front. He hoped they would have a school to which medical men in the district, and probably from beyond it, would go to see the work done in the infirmary.

THE LANCET: SUBSCRIPTION RATES.

INLAND	One Year	£2	2	0
	Six Months	1	1	0
	Three Months	0	10	6
ABROAD	One Year	2	10	0
	Six Months	1	5	0
	Three Months	0	12	6

For complete scale of advertisement charges apply to THE MANAGER.

Appointments

ETHERIDGE, C. E., M.B. Lond., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer of Health, Whitstable.

WALKER, R. N., M.B., Ch.B. Glasg., D.P.H., Medical Officer of Health, Stirling.

Westminster Hospital Medical School: MINDLINE, J., L.R.C.P. Lond., M.R.C.S., and KOKIA, M., L.R.C.P. Lond., M.R.C.S., Resident House Surgeons; GLOVER, R. McN., L.R.C.P. Lond., M.R.C.S., and ROBERTS, C. G., L.R.C.P. Lond., M.R.C.S., Resident House Physicians.

Vacancies

For further information refer to the advertisement columns.

Albert Dock Hospital, Connaught-road.—M.O. At rate of £110.
Ashton-under-Lyne District Infirmary.—H.S. At rate of £150.
Barnstaple, North Devon Infirmary.—Res. M.O. At rate of £150.
***Bath, Royal United Hospital.*—Asst. H.S. At rate of £120.**
Birkenhead County Borough Infirmary, Tranmere.—Res. Asst. M.O. £350.
Birkenhead General Hospital.—H.P. Also Cas. O. Each at rate of £100.
Blackburn Royal Infirmary.—3rd and 4th H.S.'s. £175 and £150 respectively.
Bodle General Hospital.—Sen. Res. M.O. Also Jun. H.S. At rate of £200 and £150 respectively.
Brighton, Royal Sussex County Hospital.—Cas. H.S. £120.
Cardiff City Mental Hospital, Whitchurch.—Post-Graduate Research Studentship. £100.
Cheshire County Council.—Deputy County M.O.H. £1000.
Chester Royal Infirmary.—H.P. and H.S. Each £150.
Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £100–£175.
City of London Mental Hospital, near Dartford, Kent.—Jun. M.O. £400.
Coventry and Warwickshire Hospital.—Res. H.P. Also Res. Cas. O. £160 and £125 respectively.
Derby, Derbyshire Hospital for Sick Children.—Res. M.O. At rate of £150.
Derby, Derbyshire Hospital for Women.—H.S. At rate of £150.
Derby, Derbyshire Royal Infirmary.—Ophth. H.S. £150.
Dingwall, County of Ross and Cromarty.—Two Asst. M.O.H.'s. £700 and £500 respectively.
Dorchester, Dorset County Hospital.—H.S. £160.
Dreadnought Hospital, Greenwich.—H.P. and H.S. Each at rate of £110.
Dudley, Guest Hospital.—Asst. H.S. £160.
Durham County Council.—Asst. Welfare M.O. £500.
Eastbourne, Princess Alice Memorial Hospital.—H.S. At rate of £100.
Eastcote, Middlesex, St. Vincent's Orthopædic Hospital.—Res. M.O. At rate of £150.
Edinburgh, Jordanburn Nerve Hospital, Morningside Park.—Asst. Phys. £400.
Evelina Hospital for Children, Southwark, S.E.—H.S. At rate of £120.
***Gloucester, Gloucestershire Royal Infirmary and Eye Institution.*—H.P. At rate of £150.**
Great Yarmouth General Hospital.—Sen. and Jun. H.S.'s. £150 and £140 respectively.
Halifax Royal Infirmary.—3rd H.S. £125.
Hospital for Tropical Diseases, Endsleigh-gardens, W.C.—Two H.P.'s. Each at rate of £150.
Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O. £200.
Hull Royal Infirmary.—Hon. Physician.
Huntingdon County Hospital.—H.S. £125.
Ipswich, East Suffolk and Ipswich Hospital.—Cas. O. £150 Also H.S. At rate of £120.
Leeds General Infirmary.—Hon. Gynæcologist.
Leeds, Herzl-Moser Hospital.—R.M.O. £100.
Leicester Royal Infirmary.—H.S.'s and Cas. O. Each £125.
Liverpool, David Lewis Northern Hospital.—Asst. Anæsthetist. £75.
Liverpool Eye and Ear Infirmary, Myrtle-street.—Hon. Asst. S. to Ear, Nose, and Throat Dept.
Liverpool Open Air Hospital for Children, Leasowe.—Jun. Res. M.O. £200.
Liverpool, Royal Liverpool Babies' Hospital, Woolton.—Res. M.O. At rate of £90.
Liverpool, Walton Hospital, Mill-road Infirmary, Smithdown-road Institution, and Alder Hey Children's Hospital.—Res. Asst. M.O.'s. Each £200.
London Female Lock Hospital, 283, Harrow-road, W.—H.S. £150.
London Lock Hospital, 91, Dean-street, W.—H.S. At rate of £200. Also Two Surg. Regs. Each £100.
Manchester Joint Committee on Cancer Research.—Asst. in Cancer Research Laboratories. £400–£650.
Manchester, Royal Children's Hospital, Gartside-street.—Two Asst. M.O.'s. At rate of £150.
Manchester, Royal Children's Hospital, Pendlebury.—Res. M.O. and Res. Surg. O. At rate of £125.
***Merthyr General Hospital.*—Res. H.S. At rate of £150.**
***Middlesex Hospital, W.*—Medical Men interested in Radium Treatment of Malignant Disease.** Also Dental H.S.
Middlesex Hospital, Barnato Joel Laboratories.—Asst. in Radiological Research. £350.
Miller General Hospital.—Cas. O. £150.
National Hospital for Diseases of Heart, Westmoreland-street.—Res. M.O. Also Out-patient M.O. At rate of £150 and £125 respectively.
Newcastle-upon-Tyne, Royal Victoria Infirmary, Pathological Dept.—Bio-chemist. £450.
Northampton General Hospital.—H.P., Two H.S.'s, and Two Asst. H.S.'s. All at rate of £150.
Northern Ireland Government.—M.O. £800.
Nottingham General Hospital.—2nd Cas. O. At rate of £150.
Preston and County of Lancaster Royal Infirmary.—Two H.S.'s. Each at rate of £150.
Putney Hospital, Lower Common, Putney, S.W.—Res. M.O. At rate of £150.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—District Res. M.O., Asst. Res. M.O. Also Res. Anæsthetist. Each at rate of £80.
Queen's Hospital for Children, Hackney-road, E.—Cas. O. At rate of £100.
Royal Chest Hospital, City-road, E.C.—Part-time Temporary Pathologist. At rate of £300.
Royal National Orthopædic Hospital.—H.S. At rate of £150.
***Sheffield Royal Hospital.*—Res. Anæsthetist. At rate of £80.**
Shrewsbury, Royal Salop Infirmary.—Res. H.S. At rate of £160.
Southampton, Royal South Hants and Southampton Hospital.—Two Asst. H.S.'s. Each at rate of £180.
South-Eastern Hospital for Children, Sydenham.—Hon. Asst. Phys.
South London Hospital for Women, Clapham Common, S.W.—Clin. Asst. to Out-patients.
South Shields, Ingham Infirmary.—Jun. H.S. £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Asst. H.P. £125.
***Swansea County Borough, Infectious Diseases Hospital.*—Res. M.O. £350.**
Swansea Hospital.—H.S. £150.
Taunton, Taunton and Somerset Hospital.—Sen. H.S. and H.P. At rate of £150 and £100 respectively.
Tilbury Hospital, Essex.—H.S. At rate of £150.
Uxbridge, Middlesex, Hillingdon Institution.—Res. M.O. £600.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.S. At rate of £100.
Walsall, Manor Hospital.—Res. Asst. M.O.'s. £200 and £150 respectively.
West Bromwich and District General Hospital.—H.P. and Cas. H.S. Each at rate of £200.
West London Hospital, Hammersmith-road, W.—H.P., Two H.S.'s., and Res. Anæsthetist. Each at rate of £100.
York County Hospital.—H.P. £150.

The Chief Inspector of Factories announces vacant appointments for Certifying Factory Surgeons at Crewkerne (Somerset) and Basingstoke (Hants).

Births, Marriages, and Deaths

BIRTHS.

BARLING.—On Aug. 15th, at Garston-avenue, Newton Abbot, the wife of Dr. Ivan Barling, of a son.

BEATH.—On Aug. 12th, at Elmwood, University-terrace, Belfast, the wife of Dr. R. Maitland Beath, of a daughter.

YATES.—On Aug. 16th, the wife of Dr. Henry Yates, of Alton, Hants, of a son.

MARRIAGES.

GREIG—STUART FERGUS.—On Aug. 9th, at the Chapel of the Savoy, Lieut.-Col. Alexander Greig, B.A., B.Chir. Camb., I.M.S. (Ret.), Palace Gate, London, to Nancie Stuart Fergus, daughter of the late W. S. Fergus, Solicitor, Glasgow, and Queen's-gardens, W.

JEAFFRESON—BUNTING.—On Aug. 9th, at St. Mark's Church, Sheffield, Bryan Leslie Jeaffreson, M.D., F.R.C.S., to Margaret Clarice, elder daughter of Mr. and Mrs. A. W. Bunting, of Crimicar-lane, Fulwood, Sheffield.

DEATHS.

BOSTOCK.—On Aug. 12th, suddenly, at The Priory, Burford, Oxon, John Southey Bostock, Colonel, late R.A.M.C., Commandant Royal Army Military College, Millbank, C.B.E., M.B., Ch.B., aged 55.

CHILD.—On Aug. 11th, Gerald Alfred Child, M.R.C.S. Eng., L.R.C.P. Lond., O.B.E., of Hythe, Southampton, aged 59.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

INDEX TO "THE LANCET," VOL. I., 1930.

THE Index and Title-page to Vol. I., 1930, which was completed with the issue of June 28th, is now ready. A copy will be sent gratis to subscribers on receipt of a post-card addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

NOTES, COMMENTS, AND ABSTRACTS

PREVENTIVE MEDICAL EXAMINATIONS IN INDUSTRY

AND ORGANISED MEDICAL PRACTICE.

By Dr. René Sand,

TECHNICAL COUNSELLOR OF THE LEAGUE OF RED CROSS SOCIETIES (PARIS).

PREVENTIVE medical examinations were introduced first in the army and navy, to be extended later to various schools and to the colonial civil service. Twenty or thirty years ago, however, many industrial and business concerns had already a medical service intended mainly for the emergency treatment of accidents. The popular campaign against tuberculosis roused some employers to a realisation of the danger of contagion in offices or workshops. They asked their medical service to investigate the matter; to their great surprise, numerous cases of open tuberculosis were detected in their staffs. Evidently, the only remedy for this situation was to submit every applicant for a job to a routine medical examination. This practice was found to have other advantages: it did away with the hiring of people physically incapable of working regularly; it enabled the management to assign every one to a job for which he was fit; it prevented representing old-standing disabilities—a hernia, for instance—as the result of an industrial accident, for which compensation was claimed; it gave the examining physician an opportunity to extend valuable health advice to applicants.

USES OF THE PREVENTIVE EXAMINATION.

As a rule, the results of these preventive medical examinations proved excellent; the labour turnover, the removal from one job to another, the time lost for sickness, the accidents, the wastage of goods, all diminished in a striking proportion. It became evident that preventive medical examinations save money to the employer, and that a good medical service is one of the elements of industrial efficiency. At the same time, these examinations helped the employee in preventing him from wasting his health in a job to which he was physically unequal, and in giving him an opportunity for treatment of existing handicaps.

In order to be really useful to the applicant, these examinations must be thorough; they call for the help of specialists, of X rays, of laboratory procedures. In this form they are becoming popular among all classes in the United States, where the Life Extension Institute, a non-profit yet self-supporting institution, has already made more than a million preventive examinations. Life insurance companies offer these examinations free to their policy-holders. Those who take these examinations show such diminished death-rates that the insurance companies gain two dollars for every dollar they pay to the Life Extension Institute, thus making a net profit equal to the expense they have incurred. Here we have the material proof that preventive medical examinations pay in supplementary years of life, health, and efficiency much more than they cost.

However, a man who has been found fit at a first examination may later fail in health. This led some firms to introduce an annual medical examination of their staff. We have thus three degrees in the health supervision of the employees: the summary medical examination, the thorough medical examination, and the annual or periodical examination. Of course, the first is the most usual, as it takes less time and is less expensive. With a good medical organisation it can be done in ten minutes, and is said to cost between one and two dollars in the United States. A thorough medical examination takes half an hour, and costs between 10 and 20 dollars.

DOUBTS AND FEARS.

Some workmen have feared that these examinations would be used as a pretext to eliminate trade-union leaders or people known for their radical opinions. I am told that this has actually happened; it must, however, remain very exceptional. One hardly imagines that a manager who is farsighted enough to spend a considerable sum of money in medical examinations of his staff should use them in a way which must lead rapidly to their discredit. Another more serious objection is that this procedure makes life very hard for the handicapped, and practically throws them on public or private relief. These people surely deserve our consideration. But, first of all, the examination is not conducted with the idea of eliminating everyone who is not in the best of health; it is merely made the basis of a job-selection which enables an employer to accept many of the handicapped. Those who are rejected are either contagious cases or people who could not undertake any regular work; if accepted, they would soon exhaust their remaining strength or incur accidents. Industry is not responsible for this situation, and the remedy is not to hire for a few days or a few weeks a man who will soon have to give up work, but rather to provide for him through an insurance scheme.

PREVALENCE OF ILL-HEALTH.

These examinations, whether made in industrial circles or among the general population, bring to light the rather sad fact that almost no one is completely healthy. Less than half of the people who believe themselves fit enjoy normal weight and normal posture. Less than half have normal eyesight. Less than half have a normal throat and nose. Less than half have normal teeth. Forty per cent. suffer from constipation. Luckily, 80 per cent. have a sound heart, good ventilated lungs, permeable kidneys. These statistics show that preventive medical examinations have a twofold use; in a certain number of cases they lead to the discovery of unsuspected and serious troubles which can then be adequately treated; in the majority of cases they reveal minor troubles which, while they do not imperil the life of the subject, nevertheless diminish his vitality and reduce his efficiency. The correction of these troubles puts the subject in a state of well-being from which he had been disaccustomed for years. Experience proves that one year after the first preventive examination three out of ten defects are corrected; a second medical examination leads to the correction of three further defects. This is interesting from the individual's point of view, but even more so from the point of view of the community. Mr. Homer Folks and others have reckoned that disease costs the American nation 15 per cent. of its yearly income. It is admitted, however, that at least one-third of the diseases prevalent to-day are preventable. The national income could thus be increased by 5 per cent.

PREVENTIVE MEDICINE FOR ALL.

At this point one will inevitably ask: if these examinations are so valuable, why should they be the privilege of clerks and workers in a limited number of concerns? Why does not every practitioner examine in this way each member of the families which call him when sick?

The reason is that medical practice has not yet adjusted itself to the progress of our knowledge. Not long ago medicine was more an art than a science. Contact with patients developed in the doctor a clinical sense which was almost his only resource. His therapy was limited and often perfunctory. Seeing patients belonging to various walks of life he could not trace the social elements which are the

deep causes of disease; at any rate, he could not influence them. Hygiene and preventive medicine were still in their infancy. All that is changed to-day; medicine becomes more and more of a science, calling for complicated equipment, for laboratory procedures, and for the help of various specialists. The social workers inform the doctor about the social causes of diseases and try to remove these causes. The advance of hygiene and preventive medicine puts in the hands of the physician effective weapons to protect and develop the health of the people.

But the practice of a profession cannot be transformed easily or quickly. To change one's methods, to adapt oneself to a new machinery, to create these new methods and this new machinery, necessitates a huge effort and represents a serious risk. No profession was ever more individualistic than the medical profession. Since its origin patient and doctor have been alone face to face. And now circumstances compel practitioners to work in teams; in the mutual benefit societies, in health insurance practice, in the industrial medical services, in the school medical services, in the child welfare services, in the tuberculosis, venereal disease, and mental hygiene dispensaries, they have to accept new formulas, to do collective work, to make themselves responsible to non-medical authorities; they have to coöperate with nurses and social workers; they have, in the homes themselves, not only to cure but to prevent.

ISOLATED VERSUS ORGANISED PRACTICE.

Which profession has ever undergone a greater transformation? Yet it is inevitable. Not that the family doctor is to disappear; on the contrary. There exists no greater asset for the patient. The conflict lies between the *isolated* and the *organised* practice of medicine and it is the repetition, in another field, of the conflict between artisan and big industry, between the small shop and the great store. There will remain isolated practitioners, just as there remain artisans and small shops. But organised practice will take on increasing importance, it will attract the better elements of the profession, because it is more efficient, more interesting, more scientific. And it is not less dignified or less lucrative. Some physicians fear for their independence; is the isolated practitioner really independent? He has not one master, he has a thousand. He will have to write records, statistics, reports. Is it possible to treat a patient efficiently without a record? Is it possible to compare therapeutic procedures without statistics? Health accounts need figures and books just as bank accounts. And if the doctor does his work conscientiously why should he fear inspection?

This organised practice is the kind of medicine many of us have known in the war hospitals, and we often regret that in our isolation we are deprived of the facilities we enjoyed for the treatment of the soldiers. It is also the best means to avoid the faults which have been ascribed to insurance schemes. We would not hear of a "diagnosis and a prescription in a minute" if the doctors worked in teams.

As regards the economic situation of the profession, from which many complain, raising our fees is not the solution. Let us see things as a whole; the nation pays each year a certain sum to the medical profession, from private purses, from insurance funds, from public funds. To raise this sum we have to do as the business man who wants to increase his sales. He does not raise the price of his wares. He tries to reduce his overhead expenses, to improve his production, to turn out better commodities, to spread their use; in a word, to serve the public better and to reach more people. It is exactly what the medical profession ought to do. If the practitioners worked in teams they would reduce their overhead expenses—rent, heating, light, equipment, service; they would improve their work—think of all these tuberculous, cancerous, arterio-sclerotic people whose illness is diagnosed too late and treated with antiquated methods; think of this huge preventive work which ought to preserve much more completely than is done to-day the pregnant women, the babies, the pre-school children, the school-children, the apprentices, and the adults. There is the "better commodity" which we ought to "sell" to the public. We can be sure that he will want it and be ready to pay for it. Then we will not hear any more complaints about "medical plethora"; if each man, woman, or child in England, for instance, underwent a yearly preventive medical examination and paid for it one pound—public authorities stepping in for those who are unable to spend this sum for their health—that would mean, divided equally, an income of nearly £1000 for every practitioner.

Of course, there is a long way to go before we reach that state, but is it not evident that preventive medicine is still too much neglected by our profession to our detriment, as well as to the detriment of the population? Preventive medicine necessitates teamwork, and cannot develop as long as we shut ourselves up in isolated practice. Thus the dilemma is: to stagnate in the present unsatisfactory condition, or to take a bold step forward and adopt an organised practice, which will be more efficient for the nation and more satisfactory, intellectually and materially for our profession.

THE SOCIAL SERVICE DEPARTMENT OF ST. THOMAS'S HOSPITAL.

THE work of the Social Service Department of the voluntary hospitals continues to increase year by year. It may seem a paradox, but the more State activities develop the more the voluntary hospitals are called upon to do. The annual report of the Social Service Department of St. Thomas's Hospital for 1929 gives a page of figures which, it needs little imagination to realise, must mean many and varied pressing needs. During the year 1537 patients were "convalesced" and of these 155 went to "free" beds and the rest to paying homes at a cost of over £4000, a figure which represents a decrease of cost but an increase of cases for the year. Incidentally, the report states that London has within a radius of a few hundred miles a better supply of convalescent homes than any other place in the world, and yet more homes for children, especially for medical cases, are needed. Children living under bad hygienic conditions respond more quickly to the surroundings of a convalescent home than any other type of case. The number of cases for whom home visits were paid by the Social Service workers of the hospital reached last year the total of 6417, of which more than half were in respect of out-patients and casualty cases. Accounts are given of 15 different departments of the hospital's activities ranging from new and rapidly growing departments, such as the mental department, where the early cases give much scope for social work, to the tuberculosis department where the State services have come to play such a large part, and yet still leave room for much voluntary effort. With the number of unemployed growing at an alarming rate social service work is full of difficulties these days. What effect the new Local Government Act and the public assistance committees will have on this side of the voluntary hospitals' work nobody can yet tell, but there is every reason to believe that the almoner's work will be increased rather than diminished.

A NEW WRAPPER FOR MEDICINE BOTTLES.

Messrs. H. Young, Myers and Co., of Astor House, Aldwych, London, W.C., have sent us samples of a neat container for medicine bottles. It consists of a paper bag so constructed that it lies flat while being addressed and readily expands when the bottle is being inserted. The bags are made in sizes to suit standard bottles of 6, 8, or 12 oz., and are much more convenient than the envelope or sheet of paper ordinarily used. They are firm, neatly finished, and inexpensive.

CLOTHING FOR WOMEN IN THE TROPICS.

FIRMS employing workers in the tropics usually provide a schedule of suitable equipment for the men who are going there, but the women are usually forgotten and have to rely on private advice. Even experienced tropical outfitters are rarely prepared with lists for women who propose to spend more than a brief time in the tropics. They are, therefore, apt to follow English summer fashions and to find that they are very inadequately fitted out. Dr. J. B. Christopherson [1] holds that feminine dress reform is an urgent need, for in his view the reasons why women do not survive tropical life are: the lack of preliminary medical examination, the lack of any useful occupation, and the unsuitable clothes worn by them. Dr. Christopherson urges women to wear exactly the same clothes as men: trousers, Jodhpurs, or plus-fours, with puttees, together with a tunic or smock. The evening dress suitable for this country is an invitation to the mosquito, and should always be supplemented by mosquito boots reaching above the knee, or by cashmere stockings under the silk, and the arms and neck should be protected. In the matter of underclothing women going to the tropics should seek the advice of expert outfitters used to supplying men. Wool, cashmere, silk, artificial silk, cotton, lawn, cellular material, mercerised cotton, and linen all have their place, but the wearer should be guided in their use in different areas and on different occasions by those with experience of the climate and entomological conditions of the district. Colour, texture, fabric, and style must all vary with varying conditions, and there is still room for research into the attraction of certain colours for certain insects; the relation of colours to light and heat and of fabrics to absorption, reflection and the conduction of heat and moisture.

NEW PREPARATIONS.

DRY OINTMENTS.—The selection of a suitable base for the incorporation of an active remedial drug is of great importance in the treatment of skin diseases, and does not always receive the consideration it deserves. Thus one frequently sees acute septic conditions treated with ointments, and lotions applied to a dermatosis resulting from an inherent lack of secretion from the sebaceous glands (xerodermia). The claims put forward by the manufacturers of HEKOTEKT (sole concessionaires: E. L. Fry and Co., 3, Pancras-lane, E.C. 4), a base compounded largely from "condensed skimmed milk," cannot, however, be accepted in their entirety. The casein constituent is not a new departure and has been embodied in many proprietary creams in this and other countries for years. Nor can it take the place of lotions in many of the more acute and weeping varieties of dermatitis, for a cooling and sedative effect cannot be obtained otherwise than by lotions. Hekotekt dry ointments deserve praise for convenience in application, for homogeneity, and for cleanliness; but the scope of their indications in skilled hands falls considerably short of those put forward by the manufacturers, while the combinations with drugs—such as sulphur, tar, zinc, resorcin, and chrysarobin—have the grave disadvantage of fixed percentages, which cannot be altered or modified to suit the individual patient. The preparations, while doubtless of value in selected cases, should not be used haphazard or without due consideration of the particular needs of any case in which their employment is contemplated.

COLACTIN.—The proprietors of Colactin (E. H. Spicer and Co., Ltd., Watford, Herts) state, as the main argument for its preparation, that milk sugar administered by the mouth rarely reaches the colon, and is therefore of so much the less value in modifying the intestinal flora. This preparation, cacao-oleum-lactin, is an effective suspension of lactose in mineral oil; it is lubricant of the intestinal wall and the emulsion protects the lactose (40 per cent. by weight) from digestion in the small intestine. There is medical evidence that persons with widely differing symptoms of alimentary toxæmia have benefited by the use of this simple remedy. The suggested dosage for adults is from half to one tablespoonful without additional liquid before breakfast and upon retiring, while one or two teaspoonfuls make a sufficient dose for children. The proprietors call attention to the particularly good results that have followed certain cases where the taking of their B. Acidophilus Emulsion has been combined with the exhibition of Colactin.

[1] Jour. Trop. Med. and Hyg., 1930, xxxiii., 201.

NURSING IN THE U.S.A.[1]

PERUSAL of a small volume recently issued in America conveys the impression that nursing in the United States is in some directions a more fortunate calling than it appears to be in this country just now, for it would seem that the money-making possibilities of nursing have been advertised in America to an extent under which the avocation has suffered, inasmuch as when the question of earning a living has confronted an increasing number of girls the lucrative opportunities of nursing have proved persuasive to the wrong kind of entrants. There is no temptation of this sort for nurses on our side of the Atlantic, a point which does not need emphasising. It appears also that nurses in America are subjected to the kind of public flattery which, if the pages of mid-Victorian novels can be trusted, fell formerly to the lot of nurses in this country—namely, that they are called by the public "angels of mercy." This attitude towards nurses Miss Gladwin shows to be extremely distasteful to her, as well as to represent a complete misapprehension of values. She lays stress on the necessity for gentleness, kindness, and intelligent sympathy, but these qualifications must fall clearly into line with such other qualities as power of observation, respect for discipline, and the exhibition of good manners if the true efficiency of service is to be obtained.

Those who read this wise little book should remember that it is addressed not to the public but to an audience of young women adequately, but not—at any rate, generally—in the least highly educated, so that certain passages or whole essays in which the obvious appears to be unduly stressed must not be regarded as exercises in claptrap; they represent sound teaching, but in simple words for the benefit of those who may never have had formal instruction upon the fundamental tenets of social behaviour.

[1] Ethics Talks to Nurses. By Mary E. Gladwin. London: W. B. Saunders Company. 1930. Pp. 281. 8s. 6d.

A. W. F.—With reference to the depreciation of doctors' motor-cars from the point of view of income-tax, in 1925 the Government extended the wear-and-tear allowance on motor vehicles to members of the medical profession; whilst 20 per cent. upon the written down figure has been accepted (the amount to be allowed always being at the discretion of the Commissioners), the figure now generally accepted is 15 per cent. If, however, such a figure is not considered sufficient in any particular case, the Commissioners may, upon satisfactory evidence being placed before them, make such allowance as is fair and just. In the Tax Supplement of the *Accountant*, dated March 30th, 1929, a full list of wear-and-tear allowances for income-tax purposes is given, and in the issues of the same journal dated August 10th and 17th, 1929 (pp. 350 and 358 of the Tax Supplement), space is given to correspondence on the subject.

A NEW INFIRMARY AT DEWSBURY.—The work of the Dewsbury and District General Infirmary is this week being transferred to the new building on the Moorlands Estate, overlooking the town, the old building having been sold to the corporation. There are 97 beds and a new nurses' home. The cost, which was estimated at £130,000, is now expected to reach £150,000.